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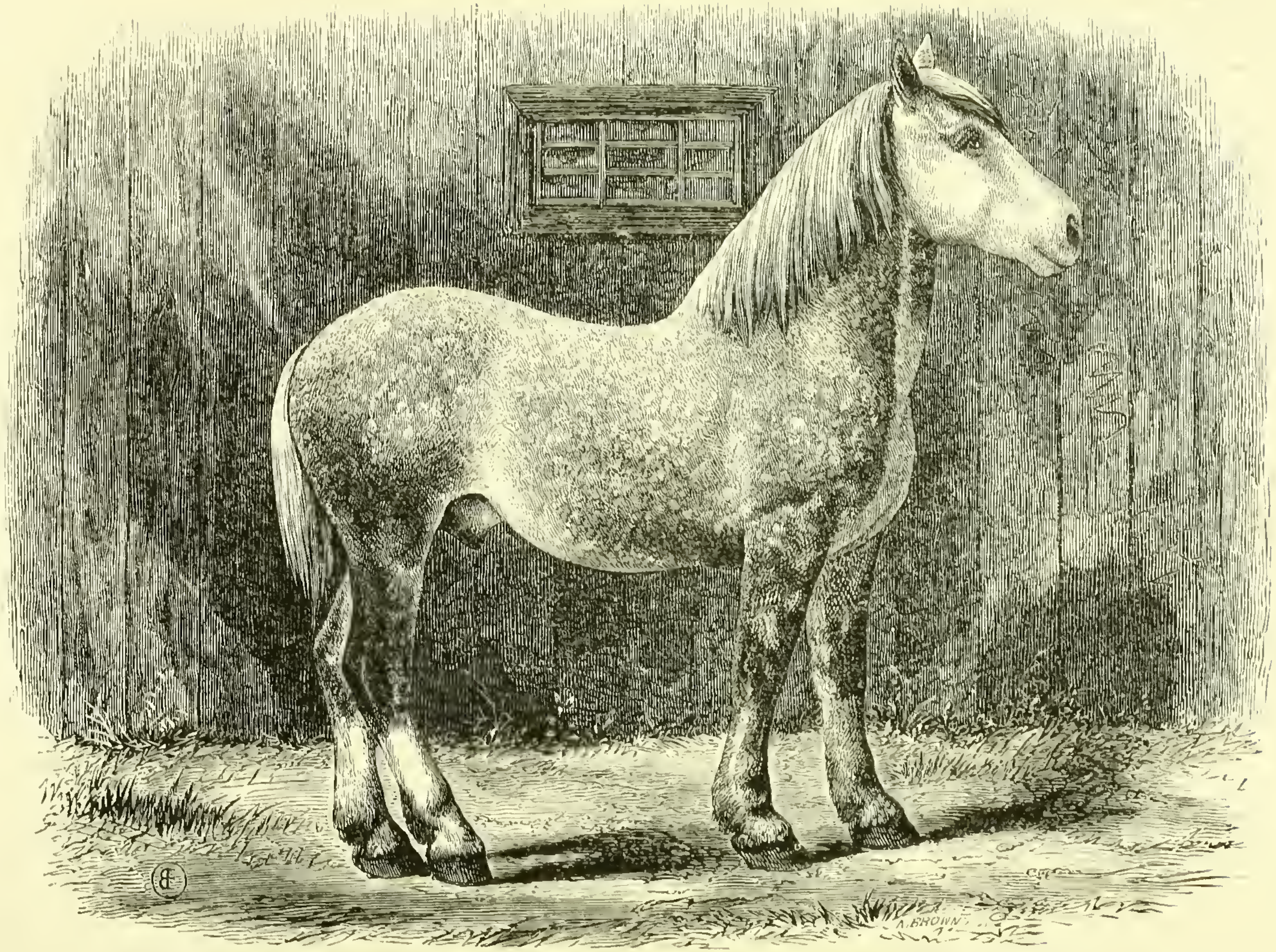


Percheron Stallion—"CONQUEROR." Imported by the Mass. Society for Promoting Agriculture, in July, 1864. He is dapple gray, 6 years old, 17 hands high, weighs 1,700 pounds, and has an easy, natural gait of ten miles an hour.
Kept at the Society's stable at Jamaica Plain.

THIRTEENTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

Massachusetts Board of Agriculture,

TOGETHER WITH

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE COUNTY SOCIETIES,

WITH AN APPENDIX

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES,

FOR

1865.

BOSTON:
WRIGHT & POTTER, STATE PRINTERS,
No. 4 Spring Lane.
1866.

STATE BOARD OF AGRICULTURE.
1866.

MEMBERS EX OFFICIIS.

His Excellency ALEXANDER H. BULLOCK.
His Honor WILLIAM CLAFLIN.
Hon. OLIVER WARNER, *Secretary of the Commonwealth.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

	Term Expires.
LOUIS AGASSIZ, *of Cambridge*,	1867
PAUL A. CHADBOURNE, *of Williamstown*,	1868
EPHRAIM W. BULL, *of Concord*,	1869

CHOSEN BY THE COUNTY SOCIETIES.

Massachusetts,	LEVERETT SALTONSTALL, of Newton,	1868
Essex,	GEORGE B. LORING, of Salem,	1869
Middlesex,	JOHN B. MOORE, of Concord,	1867
Middlesex North,	ASA CLEMENT, of Dracut,	1868
Middlesex South,	JOHN JOHNSON, Jr., of Framingham,	1869
Worcester,	THOMAS W. WARD, of Shrewsbury,	1869
Worcester West,	COURTLAND SANDERSON, of Phillipston,	1869
Worcester North,	THOMAS BILLINGS, of Lunenburg,	1869
Worcester South,	NEWTON S. HUBBARD, of Brimfield,	1868
Worcester South-East,	VELOROUS TAFT, of Upton,	1867
Hampshire, Franklin and Hampden,	THEO. G. HUNTINGTON, of Hadley,	1867
Hampshire,	LEVI STOCKBRIDGE, of North Hadley,	1868
Highland,	MONROE F. WATKINS, of Hinsdale,	1869
Hampden,	PHINEAS STEDMAN, of Chicopee,	1867
Hampden East,	ALURED HOMER, of Brimfield,	1867
Franklin,	JOHN M. SMITH, of Sunderland,	1868
Berkshire,	CHARLES O. PERKINS, of Becket,	1867
Hoosac Valley,	SYLVANDER JOHNSON, of Adams,	1867
Housatonic,	HARRISON GARFIELD, of Lee,	1867
Norfolk,	CHARLES C. SEWALL, of Medfield,	1868
Bristol,	AVERY P. SLADE, of Somerset,	1869
Plymouth,	CHARLES G. DAVIS, of Plymouth,	1869
Barnstable,	JOHN KENRICK, of Orleans,	1868
Nantucket,	JAMES THOMPSON, of Nantucket,	1869
Martha's Vineyard,	DANIEL A. CLEAVELAND, of Tisbury,	1868

CHARLES L. FLINT, *Secretary.*

THIRTEENTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts.

The past season has been somewhat peculiar. The spring opened with abundant rains, so well distributed in point of time as to produce a luxuriant yield of early grass and to give the other farm crops a vigorous start; but a drought succeeded, of unprecedented severity, so as materially to check the growth of many plants, and particularly the after-grass in our fields, and the root-crops, so important as auxiliaries in the fall and winter feeding of stock.

But notwithstanding these vicissitudes, the year has been one of prosperity on the farm, owing, in part, to the high prices obtained for farm produce of every kind, and in part to increased economy in the modes of production, while the termination of the war, in the early part of the season, returned many hands to the farm which had been withdrawn for the defence of the liberties of the country and the perpetuation of the Union, so that a feeling of exultation has pervaded the minds of the farming community to an extent never before known.

To this cause may be traced, perhaps, the fact that the exhibitions of the various agricultural societies have been more numerously attended than ever before, and this attendance has resulted in a pecuniary prosperity to these societies rarely equalled in their past history. Some of them have now become practically free from the indebtedness which they had incurred in the purchase of grounds and the erection of buildings, and are prepared to enter upon a career of increased vigor and usefulness.

The high prices alluded to have, however, had the effect to reduce the number of sheep in the State, for though a large increase has taken place in the number and size of our flocks since 1860, there was an actual falling off during the past year, which can hardly be accounted for on any other supposition than that the high price obtained, with the ready market, has sent them into the hands of the butcher. This is to be regretted. Sheep husbandry forms a prominent branch in almost every improved system of agriculture, and in many countries it has done more than anything else to lay the foundation of material wealth and prosperity. We ought to keep a vastly larger number of sheep than we do, and since we have an efficient law for their protection against dogs, it is not easy to see why greater attention is not devoted to this branch of farming.

We have additional reason for congratulation in that while other countries, and especially Great Britain, have suffered immense losses from the cattle plague, or steppe murrain, we have been spared from the further spread of the destructive, though less terrible pleuro-pneumonia, for though we may not exult in in its complete and final extermination, but few cases have occurred, and the expense of watching the disease has been comparatively slight.

In accordance with law and custom I hereby submit the Report of the Commissioners on Contagious Diseases of Cattle, which is as follows:—

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts.

The Commissioners on Contagious Diseases among Cattle, submit the following report.

Calls have been received to visit ten different towns during the last year, in three only of which has contagious pleuro-pneumonia been found, viz.: Chelmsford, Dedham and Nahant.

At the time of our first visit to Chelmsford, February 7th, one of a herd belonging to Charles Adams had died about two weeks previous, and two others were slightly ill.

The carcase of the dead animal had been carried to the woods, (about a mile distant,) and left above ground, and had become frozen. On examination, there was sufficient evidence that pleurisy had existed, but no evidence of diseased lungs, one of which had been carried away. As the symptoms of the two that were ill were not sufficiently positive, it was decided to isolate the herd, and await further developments.

On the 8th of March, another visit was made, (a request having been received,) when two more of the herd were found sick, one of which had the night previous aborted a calf.

One of the first alluded to was selected, (percussion giving a flat sound over the whole thoracic region of the right side,) and slaughtered.

The autopsy showed adhesion of the whole of the large lobe to the ribs, which was evidently of long standing, probably a year or more; several physicians being present, all were of this opinion.

On cutting through the lung, unmistakable evidence of contagious pleuro-pneumonia was present.

The isolation of the remainder of the herd was continued, during which Mr. Adams fed, with grain, one of the cows which showed but slight symptoms of illness, when we were present.

On the 8th of June she was slaughtered, and the examination disclosed adhesion to exist to the sixth and seventh ribs, and to the vertebræ. A cyst, containing a mass, weighing, by estimate, two pounds, was found in the lung. As no other cases had occurred from the 8th of March to the 8th of June, the herd was released.

It should be noted that Mr. Adams' herd consisted of five cows, which had been kept on his own farm during the season, a yoke of oxen, four two year old heifers, and three cows which he had kept in a pasture in Ashburnham. The first animal taken sick was one of the heifers he brought from Ashburnham, about the middle of August, and was taken sick about the 20th of December.

The commissioners were unable to find that pleuro-pneumonia had ever existed in any herd within six miles of Mr. Adams' farm.

Our attention was next called to the herd of Avery Whiting, of West Dedham, consisting of three cows only. The history of this herd is as follows:

In March, Mr. Whiting purchased the three cows of a dealer; the one first sick came from the north part of Waltham, the market day previous to his purchasing them. By the statement of Mr. Whiting, she was taken sick about April 1st, but according to that of his hired man, after the 21st, and was very sick for some time, but gradually recovered her appetite, and on our first visit gave seven quarts of milk per day. She was thin of flesh, and gave evidence of having suffered severely.

On the 13th of June, another was taken sick, which died the 3d of July. On the 4th, an examination was made, which disclosed the right lung wholly consolidated, and weighing twenty-six pounds. The thorax contained at least three gallons of serum; a thick coat of lymph intervened between the pulmonary and costal pleura.

On the 22d of the same month, the third cow was taken sick, and on the 24th she presented the usual symptoms of pleuro-pneumonia. Both of those that survived were kept until the 22d of November, when they were slaughtered; a description of them is given in the report relating to experiments, which have been conducted during the past year.

As the pastures of Mr. Whiting are adjoining those on which a large number of cattle are kept, and his cattle remained there until one or more of them became sick, when they were secured in the barn, considerable apprehension existed that the disease would spread; consequently, directions were given that the cattle in the immediate vicinity should be isolated, which was done a suitable length of time, when no further sickness appearing, they were released.

The next case to which our attention was called was a cow, belonging to Mrs. Carey, of Nahant. She was purchased of a dealer in Lexington in June, and had been kept at Nahant until the time she died, October 5th. The lungs were sent for examination, and it was estimated that the diseased one would weigh more than forty pounds. It presented the usual characteristics of the disease in question.

It is proper to state that this animal was kept in the same enclosure with another until she became sick, when she was shut up by herself in a stable, and as it was impossible to ascertain with certainty whether the other cattle in town had been exposed, or, if any, how many, they were all prohibited from being sent away until the commissioners were satisfied the disease had not been communicated, when they were released.

Since the appropriation, by the legislature, of $20,000, in 1864, the commissioners have expended the sum of $7,943.78, a considerable part of which has been for the experiments ordered by the executive department.

Several towns have drawn sums for claims made previous to the appointment of the commission, amounting to $1,906.36, leaving a balance of $10,149.86, which reverts to the treasury.

The conclusion of the Report of the Experiments made by order of the executive department, to determine the question of the "contagiousness and curability of the disease among cattle, (pleuro-pneumonia;) also whether for the purpose of working, milking or breeding they have been injured by exposure to disease, or by having had the disease; and also to ascertain by slaughtering them, at a sufficiently remote period, whether, and to what extent, their fattening qualities have been injured," is hereby respectfully submitted.

A report relating to the contagiousness of the disease, as shown by this experiment, was in May last sent to the legislature and printed, (House Doc., No. 292.) This report was as follows:

To the Senate and House of Representatives of the Commonwealth of Massachusetts:

In the Annual Report of the Commissioners on Contagious Diseases of Cattle, it was stated that, by order of the honorable Council, experiments were being made to test the question of *contagiousness* and *curability* of the disease called pleuro-pneumonia, and that "as the experiments instituted are not concluded, the result will appear in a future report."

The results of the experiments on the *contagiousness* of the disease having since been obtained, the following Report is respectfully submitted.

On the 23d day of June, 1864, one of the cows belonging to Levi Smith, of Ashby, was killed and found to be diseased with pleuro-pneumonia, in the contagious form, although Mr. Smith had stated to the Commissioners that he was confident his herd would not take the disease, from the fact that the ox which was slaughtered on the third day of June, and found to be diseased, was removed from contact with his animals soon after the sickness commenced.

It was then determined by the Board of Commissioners to select a suitable place to experiment, (agreeably to the order of the honorable Council,) they being confident that material could be obtained in the herd of Mr. Smith.

July 1st.—A piece of land, with a barn thereon, belonging to Benjamin Sewell, Esq., situated in Newtonville, was selected for the purpose.

The building was well adapted for the experiment, being situated on high land, and thoroughly ventilated.

July 2d.—On visiting the herd of Mr. Smith, to select an animal to which others should be exposed, I found nearly all of them sick. One was selected which was very sick, and as it was somewhat doubtful whether she would survive a sufficient length of time, another, not as severely affected, was ordered to be sent to Newtonville. All the animals in Mr. Smith's herd, (excepting the cow slaughtered, and a bull,) ten in number, appeared healthy on the 23d of June, yet on the 2d of July all but two were sick, and on the 3d of August, when slaughtered, all but one were diseased.

July 6th.—An examination of the two cows from Ashby was made—the one most severely affected showed evidence of extensive disease in the right lung. By auscultation no respiratory murmur could be heard; by percussion a dull, flat sound was elicited over the whole space occupied by the lung.

The rational symptoms were decidedly better, the appetite was partly restored, the respiration slower and less painful, the eyes brighter, and there appeared to be less debility.

In the other, it was impossible to locate the disease, and if I had not seen the animal when sick, I should not have suspected it at this time; the appetite was good, the pulse and respirations were normal.

July 8th.—The cows (which had been purchased in Maine for the purposes of the experiment,) four in number, arrived in Newtonville.

It was voted that I should visit the hospital daily, and record the results of my examinations.

Each cow brought from Maine was placed between the two diseased cows, and kept for twenty-four hours.

July 13th.—The two diseased cows were slaughtered. In the one most diseased, the pulmonary and costal pleura on the right side were inflamed; a thick coat of lymph covered the whole surface of the lung. On cutting through the lung, nearly the whole of the large lobe was consolidated; otherwise, the animal was perfectly healthy.

July 14th.—The Maine cows had been examined daily; the number of pulsations and respirations per minute for the five preceding days averaged as follows:—

No. 1.—Pulsations per minute,	48;	Respirations per minute,	18
" 2. " " "	50;	" " "	17
" 3. " " "	52;	" " "	18
" 4. " " "	50;	" " "	24
August 5th.—The respirations of No. 4 were		. . . .	30
" 6th. " " " "		. . . .	36

No material alteration could be detected until August 9th, when, it being excessively hot and sultry, all the cows breathed quicker.

August 12th, 13th, 14th, and 15th.—Respirations from 18 to 24 per minute, excepting in No. 4, which were 30 and 36 per minute.

August 19th.—Forty-two days from exposure, a cooing sound was heard in the right lung of No. 1.

August 20th and 21st.—The respirations were 24 per minute.

August 22d.—The respirations were 40 per minute; pulse 60, hard and full. The animal does not ruminate, and the secretion of milk is nearly suspended.

August 23d.—Respirations 38, accompanied with a moan; pulse 80 and small; appetite partly gone.

August 24th.—Respirations 33, and easier.

August 25th.—Respirations 38, and easier; and percussion gives a flat sound on the right side, near the elbow.

August 26th.—Respiration and circulation slower; has considerable cough.

August 27th.—Commenced ruminating; coughs; the appetite from this time improved, as also the secretion of milk; she did not at any time after her arrival at Newtonville give more than four quarts per day, and in two weeks from this time there was no appreciable diminution in quantity.

August 27.—In No. 4, one-quarter of the mammary gland is inflamed and hard; considerable fever exists, the pulse running up to 60; the respirations 52 per minute.

September 3.—No. 4 has a cough, and is quite feeble. No. 2 has not shown any symptoms of lung disease; she is old, and masticates hay imperfectly, consequently some derangement of the digestive organs exists. No. 3: for a few days, the coat stared; the eyes appeared dull; she moved about reluctantly. Auscultation and percussion give no sign of lung disease, and, if any exists in Nos. 2, 3 and 4, it is remote from the surface; at least, I cannot detect it by the usual form of examination.

There appeared to be more constitutional disturbance in the cow No. 4 than is usual in an attack of mammitis; the quickened respiration, cough, and great prostration, are prominent symptoms of pleuro-pneumonia.

On the 26th of August, a proposition was made by a member of the Board, (Mr. Lincoln,) to select another locality remote from Newtonville, purchase some cows and expose them to the diseased animal.

I objected to it, for the reason that before a suitable place could be prepared, and the animals procured, the only case which I could positively affirm had contracted the disease by the first exposure, (and that a comparatively mild one,) would be so far advanced as to be unable to propagate the disease.

I made a proposition that the building at Newtonville be thoroughly disinfected and cleansed, and that in twenty days after the cow No. 1 was attacked, two or more healthy animals be purchased and exposed there to test the length of time in which diseased animals can communicate the disease. Several instances have occurred during the past five years wherein healthy animals have been exposed to diseased ones, which had previously communicated the disease to others, without receiving the infection. My proposal, being objected to, the first was adopted.

The farm on which the Soldier's Home is located in Weston was selected. A shed was erected, and two animals procured, when we were visited by the selectmen, and nearly all the farmers in that vicinity, protesting against the disease being brought into their neighborhood, but if it must be, requesting that another place be selected.

The objections offered being reasonable, the farm of D. W. Jacobs, in a retired place, was selected, the shed removed, but not until the morning of the 4th of September did the exposure commence.

Two cows at Newtonville, Nos. 1 and 4, were carried to Weston in the night time, arriving at Weston on the morning of the 4th of September. They (the four cows,) were kept in the shed (made of rough boards,) for one week, when the two diseased ones were in the night time carried back to Newtonville.

Not the slightest evidence existed that either of the animals at Weston had contracted the disease up to the time of its appearance at Deer Island, when on the 21st of November, a calf which was attacked with the disease four days previous, was carried to Weston and placed between the two cows and kept for fifteen days, after which it was slaughtered. The autopsy showed extensive disease of both lungs, probably not more than one-third of one lung being in a healthy condition. On the 17th of January, 1865, forty-two days from the time the calf was killed, and fifty-seven days from the first day of the exposure, one of the cows, No. 1, was evidently sick, and with thoracic disease.

The symptoms were, almost constant coughing, (a suppressed sore cough,) eyes dull, head depressed, loss of appetite, great prostration, walking with reluctance across the yard to drink.

The other cow has coughed occasionally for two weeks, no other symptoms present, looks lively, eats well, and is in calf.

In the first mentioned cow the cough subsided in seven days, and the appetite returned.

On the 28th of January the two cows were carried on a sled in the night time to the hospital at Newtonville. On the 29th, the first mentioned Weston cow has a severe hoarse cough, otherwise is improving.

Feb. 1st.—The Weston cow, No. 2, is evidently sick, partial loss of appetite; looks dull.

Feb. 2d.—The same.

Feb. 3d.—The same. No. of respirations, 20 per minute; pulse, 92 per minute.

Feb. 4th.—The same. No. of respirations, 20 per minute; pulse, 92 per minute.

Feb. 5th.—A tubular sound is distinctly heard on the left side. No. of respirations, 20; pulse, 84.

Feb. 6th.—No. of respirations, 28; pulse, 80. The expiration is painful, causing a moan.

Feb. 7th.—Pulse, 80; respirations, 24.

Feb. 8th.—Aborted calf which lived about twenty minutes. The cow is extremely debilitated, and I administered a diffusible stimulant.

Feb. 9th.—Pulse, 80; respiration, 28.

Feb. 10th.—Pulse, 80; respiration, 28.

Feb. 11th.—Pulse, 80; respiration, 28.

Feb. 12th.—Pulse, 98; respiration, 16. Moaned at every breath.

Feb. 13th.—Pulse imperceptible; respiration difficult.

Rumen tympanitic; gave aromatic spirit of ammonia: punctured the rumen, leaving in the carrula, which gave some relief; removed placental membranes.

Feb. 14th.—Again tympanitic.

Feb. 15th.—Diarrhœa has commenced.

Feb. 16th.—At noon, dead.

The autopsy was made on Friday, the 24th, in presence of a large number of gentlemen, several physicians being present. On removing the ribs on the left side, the pulmonary and costal pleura were slightly adherent by the effused lymph, and to the mediastinum was quite firmly adherent, requiring the knife to separate it; a small quantity of serum was in the left cavity of the chest, nearly the whole of the lung was solidified, presenting the peculiar appearance of contagious pleuropeumonia, though not as well marked as when the animal has recently died, yet the thickened interlobular tissue, the dark red spots so well described by Prof. Simonds, were present.

The diseased lung weighed twenty-three pounds four ounces, the right lung was healthy and weighed about five pounds, (the animal was not bled.) The abdominal viscera were examined, and were found healthy. By reference to first part of this Report it will be seen that the Maine cow, No. 2, had never shown any symptoms of having contracted the disease, and was a second time exposed to No. 1, not directly, but was driven to within a few feet of her daily in going out to drink. On the 30th of January it was decided to feed her with meal for one month and have her slaughtered, as good condition could not be maintained with hay for food.

March 13th.—She was slaughtered and both lungs were found diseased in the acute stage.

The lower border of the large lobe of the right lung, seven inches in length and about six in breadth, was solidified; the left lung contained a solidified portion nearly round in the inferior part of the large lobe; on the surface, in contact with the diaphraghm, the pleura was slightly inflamed; a few shreds of lymph were found, which would have eventually formed an adhesion of the lung to the diaphragm.

On cutting through the diseased parts, the peculiar appearance found in contagious pleuro-pneumonia was present, the dark red lobules encircled by the infiltrated, thickened, yellowish white, interlobular tissue, producing the marbled aspect of much brighter colors than were found in the cow that died, which is accounted for from the fact that she had not shown symptoms of sickness, and was examined immediately after being slaughtered—whereas the other (No. 2, Weston,) was sick sixteen days, and was not examined until eight days after death occurred.

The *results* of the experiments so far are, that of the four Maine cows exposed to the two from Ashby, which had been sick twelve days at the time of the exposure of No. 1, the first contracted the disease, the second doubtless escaped, the third and fourth showed symptoms of illness, but not of sufficient intensity for me to assert positively that they had pleuro-pneumonia. Sixteen days after the first symptoms of the disease appeared in the cows Nos. 1 and 4, the two cows at Weston were exposed to them. More than seventy days passed without either of them becoming ill; when on the 21st of November a calf which had been but four days ill was placed between them and kept for two weeks; both took the disease, one died; the other is alive and in a thriving condition. During the sickness of the animal that died she was daily driven to the yard, and passed within a few feet of the cow No. 2, (Maine,) and on the fourteenth day of her illness I found her in the apartment occupied by the Maine cows. (I had unintentionally neglected to shut the door two hours previous.)

On the 13th day of March, when slaughtered, both lungs of the cow

No. 2, (Maine,) which had escaped two previous exposures, were found diseased. In short, four of the six exposed have certainly contracted the disease, and it is not certain that the other two have not.

It is evident from the foregoing that two points have been established.

1st. *That the disease is contagious.*

2d. That it is more surely communicated by affected animals in the early stage of the disease than at a later period.

PATHOLOGICAL ANATOMY.

I know of no author who has distinctly stated that there are anatomical changes in the disease called pleuro-pneumonia which is contagious, and the *ordinary* disease of the same name. From my own observations, in a somewhat extensive practice among cattle, extending over a period of fifteen years, but few cases of acute disease of the lungs have occurred. In one which I treated in 1861, which proved fatal, an examination was made. *(A well marked case of pleuro-pneumonia.)*

The autopsy showed inflammation of the pleura, effusion of serum into the thoracic cavity, solidification of the lung, *without the thickened interlobular tissue.*

The lungs of a cow that died of pleuro-pneumonia, in Needham, were brought to me for examination. The pleura was inflamed, the lower third of the lung was hepatized, solidified, yet on cutting through it there was not the infiltrated, thickened, interlobular tissue found in the other form of the disease.

A cow belonging to the pauper establishment at East Douglas was sick and died. As the symptoms resembled those described as existing in contagious pleuro-pneumonia, the commissioners were requested by the selectmen to visit Douglas. The carcase was exhumed and the lungs taken out. On examination both lungs were found diseased; a large part of one lung and a portion of the other was hepatized, but the *marbled aspect caused by the dark red spots and the yellowish white lines, was not present.*

No other animals having been attacked in either of the two herds alluded to, it is fair to presume that both had a different kind of disease from that under consideration.

In a work published in 1840, (two years before the contagious pleuro-pneumonia broke out in England,) by the Society for the Diffusion of Useful Knowledge, edited by Mr. Youatt, is a description of acute and epidemic pneumonia, in which he says: "On examination after death the lungs are gorged and black with blood; they are softened and easily torn; they however contain some spots of hepitization, or condensed substances, and often abscesses filled with pus. The pleura, the pericardium and the diaphragm are black, thickened, and disposed to gangrene."

Dr. J. M. Kreutzer, in a valuable work on pleuro-pneumonia, published at Erlanger, in 1854, says: "Still later the lungs are found enlarged and their weight increased. They are firm, compact, liver-like, and there is an absence of crepitation. The surface is not uniform, but divided into irregular portions by numerous broad, yellowish white lines. The cut surface presents the same *marbled appearance* as before, caused by the *change in the interlobular tissue*, which is sometimes from one to two lines thick; with these the *red intervening* tissue contrasts strongly."

A very interesting paper on the disease designated pleuro-pneumonia epizootica in cattle, by P. Verheyen, Professor of the Veterinary School, Brussels, translated from the "Journal Veterinaire de Belgique," by Mr. W. Ernes, says, alluding to experiments made by Vix: "But the characteristic sign which distinguishes the epizootic pleuro-pneumonia from all other inflammation of the viscera, namely, the *marbled aspect, was present.*"

Professor Hertwig, of Berlin, in describing a tumor, writes: "All this mass was indurated, and offered much resistance to the knife; notwithstanding which the muscles were easily divided, and these presented the same marbled appearances as lungs which had undergone the *disorganization peculiar to the pleuro-pneumonia epizootica.*"

In a lecture delivered before the Royal Agricultural Society, England, on the anatomy, physiology and pathology of the organs of respiration and circulation, with especial reference to the nature of pleuro-pneumonia in the ox, Professor Simonds, of the Royal Veterinary College of London, says: "The name given to the affection to which I am about to allude, by almost universal consent, is pleuro-pneumonia. I object, however, to the malady being thus designated; and if my view of its nature be correct, a less appropriate name could scarcely have been selected.

"The amount of deleterious matter received at each inspiration appears to be insufficient to interrupt at once the functions of the lungs; for were this the case, death would speedily occur from asphyxia; whereas we have constant proofs that the disease we are considering is partial in its attacks and insidious in its nature, making its way stealthily, being very often unobserved until it has made great inroads in the constitution. This character of the affection is alone sufficient to create a doubt of its being inflammatory, for inflammation of the lungs, *even at its commencement, is marked by unmistakable indications of ill health.* The absence of the ordinary symptoms of *pneumonia, together with the peculiar changes of the lungs*, have satisfied me that pleuro-pneumonia is not of an inflammatory nature at its outset, and that inflammation is rather the result than a cause of the disease. It is difficult to explain the precise change which takes place in the blood from the operations of the aërial poison; but it appears to me that the vitality of the fibrine is interfered with, and that it, with the albuminous constituents of the fluid, also altered in quantity, is transuded from the capillary vessels, and finds its way into the areolar tissue of the lungs, accumulating where this tissue exists in greater abundance, *namely, in the interlobular spaces.* This inordinate transudation seems to depend on a tendency in the blood to separate into its several constituents, arising most likely from the diminished vital force of the fibrine, and an arrestation to the conversion of the albumen of the serum into fibrine. The fibrino-albuminous portions of the fluid are thus changed, and probably augmented, and their exudation is a natural consequence of such condition. The red corpuscules being in part deprived of the liquor sanguinis in which they float, are retained in the capillaries, where they accumulate in unlimited numbers, obliterate their passage, and compress the air-cells they surround, so as to stay the entrance of the air, and produce, as elsewhere stated, the dark-colored spots which stud the lungs. It is these effusions, and the obliterated condition of the vessels, which give bulk, increased weight and solidity to the lungs, and destroy their functions as aërifying organs. From this explanation it is evident that I regard pleuro-pneumonia to approach nearer to a *dropsical* than to an inflammatory disease."

PERIOD OF INCUBATION.

From the foregoing it appears that from forty-two to sixty days is the time of incubation with animals such as have been used to experiment with the past year; in the one well advanced in pregnancy, (No. 2, Weston,) a longer time elapsed, fifty-six to seventy-one days, before well marked symptoms appeared, though the slight cough and the firm adhesion to the mediastinum indicated that the animal was affected at the earlier period above named.

If it is desirable to experiment further in relation to the *contagiousness* of the disease, and the effect of the disease upon the milking, fattening and breeding qualities of the animal affected, it appears to me that an experiment upon a much larger scale should be made. I some months ago submitted a verbal proposition like the following:

That a herd of twenty well-fed animals, the cows good milkers, be selected, and either remain where they have been kept, or removed to a good barn, and tied up as animals are usually kept fastened. That when an animal of another herd is unmistakably affected with the disease, and has exposed freely for four days, say three on each side, take the six and tie them among the twenty healthy, and keep the whole together until the result is manifest. During the time of incubation and afterwards, have the cows fed as they have formerly been, and also have the milk accurately measured or weighed, and a record kept of the quantity given by each animal. After the animals become affected, select say four or more which have been attacked with equal severity, treat one-half with such remedies as appear to be indicated, leaving the other half to nature, and observe and record the results.

Finally, keep the same herd together for at least three years, subjecting them to the same treatment milking herds usually receive, keeping an accurate account of the milk given by each cow, and also recording the condition of the animals, both before and after becoming affected, and at the proper time before slaughtering them, increase the quantity of food, for the purpose of fattening, recording the results.

At the reception of the first Order of the honorable council, adopted April 20th, 1864, I did not suppose it was intended to carry on an experiment, except for the purpose of testing the contagiousness of the disease, and incidentally the curability or recovery of the animals which were isolated by order of the commissioners. The first three herds were isolated, and the results of the condition of those slaughtered given in the annual report. My reason for making the above proposition was, that no experiment had been made in which the healthy animals to be exposed, nor the diseased ones to be placed with them, were under the same influences as the herds of animals which had become infected during the past five years; consequently the experiments have not given a fair exhibition of the character of the disease, as it usually occurs. In the first place, the infected animals have not been placed with the healthy until several days after the disease commenced. In all or nearly all the herds in which the disease was traced to contact with animals from diseased herds, the animals which communicated the disease were apparently healthy for considerable time prior to the commencement of the attack; consequently they became accustomed to the company of their new companions, freely mingling with them.

Secondly. The buildings selected for the purpose of experimenting (from the fact that many doubted the contagious nature of the disease,) were entirely unlike those in which a large majority of the herds of cattle are kept in Massachusetts. As the disease is now *proved to be contagious*, it appears proper to ascertain *how* contagious it is, under the same conditions in which a thriving farmer keeps his cattle who raises milk with profit, not inviting the cold winds to blow upon his cattle, lessening the secretion of milk, and the fat upon his animals, or requiring a much larger amount of food to retain it.

Again: Past observation has demonstrated, that in animals well fed, and good milking cows, the disease was taken and proved fatal in a much larger proportion of cases than with cattle of the poorer class, and more sparingly fed. The cattle used for experiment the past year were not great milkers, and were rather poor, and were selected at considerable distance, to prevent the possibility of their ever being exposed to the disease previously. An experiment worthy of the subject, and of the Commonwealth of Massachusetts, under the direction of competent persons, would doubtless produce results of great value to the people of the State. Certainly, if the disease is a fixed institution, it is desirable that all the knowledge relating to it be obtained, to guide in the future.

Respectfully submitted.

E. F. THAYER.

The cows were kept at Newtonville until May 18th, when a bull was purchased, and with the cows was sent to pasture at Lovell's Island, Boston Harbor.

June 9th.—Visited the island and found them all in thriving condition, excepting the roan cow, which calved March 18th; she looked haggard and dull, had staring coat, and was poor in flesh compared with the others, and in consideration of the large amount of food on the island.

The calf sucked the cow during the summer.

July 11th.—Again visited the island and found all, with the above exception, had accumulated flesh rapidly. In July, the officers in charge of Lovell's Island directed that all the animals be removed, as some improvements were to be made; therefore, Hog Island, situated in Hull, was selected, and the cattle removed there.

A visit was occasionally made, and the animals examined. No material change occurred in their condition until the excessive drought dried up the grass, when all of them lost flesh.

September 19th.—The four cows, bull, and calf, were slaughtered at Brighton.

AUTOPSIES.—The roan cow (No. 1, Maine,) was first killed. On removing the right lung it was found adherent to the ribs at its lower border, about five inches in length and four in width; that portion of the lung appeared wasted, and on the inner surface was a cicatrix, as if suppuration had taken place, and ulceration sufficient to open the cyst, causing a discharge of the contents of the cyst into the thorax. A small cyst was found in the immediate vicinity. There was also adhesion of the left lung. All the other organs appeared healthy; the uterus was empty.

The next killed was No. 3, Maine cow. All the viscera, both thoracic and abdominal were healthy; the uterus contained a well developed fœtus.

The No. 4 Maine cow had a small portion of the pulmonary adherent to the costal pleura; the lungs were healthy, as were all the other organs; the uterus contained a fœtus not more than four weeks old.

No. 1, Weston cow.—The superior part of the large lobe of the left lung was adherent to the ribs and to the vertebræ, and in the lung was a cyst containing a mass about three inches in length, and two in breadth. Otherwise, the organs were perfectly healthy. The uterus contained a fœtus about two months old.

All the organs of the *bull* and *calf* were healthy.

Two of the three cows owned by Avery Whiting, one of which was attacked by the disease in the latter part of April, the other the 22d of June were sent to my place in West Newton on the 31st of July. The first mentioned calved a few days previous to the attack, and on the 24th of June, when I first saw her, had a good appetite, and gave about seven quarts of milk per day, was thin of flesh, and coughed frequently.

The other showed the first symptoms of illness on the 22d of June, previous to which she gave three gallons of milk per day, and was in good flesh. On the 24th of June she presented the following symptoms:

The pulse was eighty per minute, small and wiry; respiration thirty, short and apparently painful; the coat stared; the eyes were dull; and considerable saliva flowed from the mouth. By percussion, a dull, flat sound was emitted on both sides of the thorax. The appetite was entirely lost. Occasional visits were made. No material change in the symptoms appeared until the 13th of July, when the appetite began to improve.

Her condition, August 1st, was little better than a living skeleton; the hair stood out and had an unhealthy appearance; she coughed almost incessently both night and day; the secretion of milk was lost, and with the best of food for producing milk,—green grass and sweet corn fodder,—not over half a pint a day could be drawn.

The appetite was voracious, yet but little improvement was manifest in her condition for two months, when the cough partly subsided and she began to gain in flesh, and continued to do so until she was slaughtered, yet no milk was secreted. No one would suspect she was diseased unless she was compelled to move a few steps quickly, when a fit of coughing would invariably follow.

With the first mentioned cow, but little improvement was produced in her condition.

Autopsy, Nov. 22d.—Seven months after being attacked with the disease:

The superior portion of the right lung adhered to the ribs and diaphragm, eight inches in length and six in width; the lung contained a solidified mass. The left lung and heart were healthy, as were all of the abdominal viscera; no fœtus in uterus, although she received the bull in June. The autopsy of the second cow, five months after the attack, showed extensive adhesion of both lungs to the ribs and diaphragm, and nearly in the same locality, with an incysted mass in both. The other viscera were healthy.

The results from the foregoing experiments are as follows:

1st. That two of the four cows brought from Maine had the disease from an exposure of twenty-four hours, to the two animals from the herd of Levi Smith of Ashby.

One of the four cows had the disease from a subsequent exposure. The other cow escaped the disease.

The two Weston cows were exposed for one week to two of the Maine cows, fourteen days after they had been attacked with the disease.

There is no evidence that either of the Weston cows took the disease from this exposure.

They were afterwards exposed to a calf which had been sick but four days, for the space of fifteen days, and fifty-seven days after the first day of exposure one of them was sick. Seventy-one days after the exposure the second cow became sick and died.

The autopsies disclosed the fact that both of these animals had pleuro-pneumonia.

2d. No working animals being in our hands for experiment, we give no conclusions in relation to the effect of the disease on such animals.

3d. It is evident that if a cow is attacked with the disease when having a large flow of milk, the secretion will be partially or wholly suspended, depending on the violence of the attack, and the duration of the acute disease.

4th. Three of the five cows became impregnated, the one which escaped the disease having the oldest fœtus.

5th. From the foregoing, (and previous observation confirms the opinion,) it is evident that animals which have had an attack of pleuro-pneumonia will fatten readily, although considerable lung tissue has been lost.

Respectfully submitted.

E. F. Thayer,

For the Commissioners.

December 27, 1865.

It may be stated that the cattle plague, so called, now raging so virulently in England and Scotland, is quite different from the disease commonly called pleuro-pneumonia, which was imported into this State from Holland in 1859. The period of incubation is much shorter, being usually, as nearly as has been ascertained, only from eight to ten days, while that of pleuro-pneumonia is irregular, but most commonly from forty to fifty days. The symptoms are also quite different, for while the one is an abdominal, the other is a *lung* disease. The fatality of the former is often as high as eighty to ninety per cent., and cases are by no means uncommon in England where it has swept off every animal in the herd, while the absolute losses by death of the latter may not exceed about thirty per cent.

But while a disease so contagious and so destructive is raging in several of the countries of Europe, the importance of continuing the Board of Cattle Commissioners in existence, in order to be prepared for such an emergency as the outbreak of the plague among our herds must be apparent—for when it is considered that it may be introduced, not only by the importation of cattle, which, happily, is now absolutely prohibited by a recent Act of Congress, but also through hides, wool and other articles brought in by commercial traffic—the possibility of its arrival here cannot be regarded as chimerical.

It is the duty of every one, and especially of the farming community, to guard against its introduction, and to take all needed precautions against such a disaster.

PUBLIC MEETING OF THE BOARD AT WORCESTER.

The annual meeting of the State Board of Agriculture, for the discussion of agricultural topics, commenced its sessions at Washburn Hall, Worcester, Tuesday, Dec. 12, at 12 o'clock, M., and was called to order by Dr. George B. Loring, of Salem.

REMARKS OF DR. LORING.

Gentlemen of the Board of Agriculture:—The hour has arrived which has been selected as the time for the annual meeting of the board, for the discussion of those agricultural subjects which are connected with the interests of the Commonwealth.

The board intended, in establishing these meetings, to furnish an opportunity for a free and easy discussion, not only among its own members, but also among those agriculturists in the State who take an interest in the practical business of farming, and who also endeavor to enlighten their understandings upon those questions which come before every tiller of the soil.

Our meetings heretofore have been attended with abundant success. There are members of the board present who will not soon forget the interesting discussions which we had at Springfield, where Professor Agassiz first appeared among us, and attracted the attention of the Commonwealth, by the sound sense and practical wisdom of his suggestions, drawn not from practice, but from scientific investigations. And we have all congratulated ourselves and the Commonwealth, that those suggestions were so fully appreciated that he has been placed upon this board, to mingle his profound science with our practical knowledge, and to bestow his wisdom like the abundant rain, for the benefit of that great industry which we represent.

These meetings resulted in so much good, that we have been induced to call this session at Worcester, in the heart of the Commonwealth, and in the midst of a large farming district, hoping that the discussions might be so fully attended that the minds of the farmers of this section would be roused to new interest in their calling. I have no doubt that before the discussions close that will be the case.

The State Board of Agriculture of Massachusetts has a right to look now, at the close of this year, with considerable gratification upon the condition of agriculture in this State and in New England. We have not been idle in this section of our country. At no period, and in no year, have agricultural fairs —those institutions which come directly under the cognizance of the board—been sustained so well as during the last season. The trials and distresses of the war being over, it seemed as if the people took heart once more to assemble at agricultural meetings, to congratulate themselves upon their success, and to stimulate each other in their labors.

Not only has the interest in these meetings increased, so far as my observation goes, but the stock presented at the fairs has greatly improved. The New England Society, which originated with this board, and which has stimulated and roused the farmers of New England to compare their experiences, and to exhibit their flocks, and herds, and products,—that society, which is the child of this board,—is doing the good service which was expected of it. True, some little fault has been found with us; because we congratulated ourselves upon our last annual exhibition. Gentlemen who do not live within the limits of the United States, took it upon themselves to say that the officers of the society were rather extravagant in their praises of it, and that with the exception of the exhibition of agricultural machinery, the show was not quite up to the standard established for us elsewhere. But when they remember that there were present, from the hard pastures of New England, Shorthorn cattle of as pure blood and as approved form as can be found among the best herds in England, and which were presented in as good condition as can be found anywhere; and that there were Devons, and Jerseys, and Ayrshires, of the highest quality, and that, too, in spite of the fact that New England is not by any means a most salubrious agricultural distict, they ought to allow us to be proud of that spirit which has overcome all obstacles it has to contend with, and furnished such animals as were exhibited there. We who live here are reminded that it is the intelligence and skill of New England agriculturists which furnished that exhibition, and which, in spite of unkindly influences, has brought farming to a high degree of excellence. Our horses compare well with any on earth. Our cattle, as I have said, are not easily surpassed. In sheep-husbandry, we have developed the foundation of the great system of wool-growing, peculiarly our own, suited to our wants, and customs, and soil and climate—an interest which has at last won for itself proper consideration in the halls of Congress. I think the Board need not be ashamed of its efforts to bring the farmers of New England together.

And yet more. We have not forgotten the stand which the Board of Agriculture took, some years ago, upon the question of contagious diseases among cattle. The zeal with which the members of the Board and the Secretary presented the difficulties connected with that subject to the legislature, secured safety to the country against an encroaching and formidable disease, and through the aid of Governor Banks, established the policy of extirpating an evil which no skill or power could cure or control. Time has proved the wisdom of that course. For now, while some among us still chide and ridicule the action of the Board, a plague breaks out in Europe, one great branch of agriculture is threatened with destruction, and the authorities there send to the Board of Agriculture of Massachusetts for a detailed account of their proceedings, and for the report of the commissioners before that session of the legislature called to arrest, if possible, the disease, before it had ravaged the Commonwealth. No man has yet proved that the course then pursued by the Board in that matter was wrong. But sound judgment declares, and facts go to show, that the course of the Board was right, and proper and worthy of emulation.

While the Board has a right to congratulate itself on this act, just now sanctioned and approved by high authority abroad, it can turn with satisfaction to the labor performed by its various members and the Secretary, aided by the liberality of the Commonwealth, for the investigation of agricultural subjects, and the diffusion of knowledge among the people—knowledge eminently practical, and drawn from the agricultural experience of the Commonwealth.

There are one or two questions which I trust will be brought up for discussion before these meetings close, and will attract the attention of the Board. The subject of sheep-husbandry should be thoroughly and broadly investigated, and I regret that it will not be in my power to be present, to join in the discussion, and to learn of others. It cannot be explored too much. Massachusetts cannot be expected to rival Ohio, and Illinois, and Texas in raising wool; but she can excel them in raising sheep, for the benefit of those large wool-growing States, if the farmers will turn their attention to the business as the farmers of Vermont have long done, with great success. Here, in New England, is the great seed-bed—so to speak—of American merino sheep, which, when carried to a warmer climate and more luxuriant pastures, take on larger size and coarser wool, and less of it, but which, reared on our short, sweet pastures, and in this colder climate, possess a firm, hardy nature, and when carried to those other States keep the pure blood constantly alive there. I hope that when this subject comes up, it will be dealt with as one of the most important branches of industry in the Commonwealth, and that farmers will be encouraged to enter into it with all the light which science and the best practice in breeding will afford.

There is another subject which I trust will be brought up. It is the matter of peat as an article of fuel. Almost all our farms in Massachusetts are supplied with a peat-bog of larger or smaller dimensions. I suppose there is peat-fuel enough in Massachusetts to supply all the stationary engines, and all the locomotives, and all the furnaces, grates and cooking-stoves with heat for, I do not know but three centuries to come. The question is, how are we to get at this fuel? In its present form it is said to be unwieldy, and it is moreover stated that it has been tried on railroads and has failed to furnish sufficient intensity of heat. But there must be, and there is a process by which peat can be put into such a form as to be a most admirable fuel. Now, while the present prices of coal continue, it costs the people of this State almost as much to run a stove or an engine as it does to run a thoroughbred horse. It seems to me it is time that attention should be turned to the investigation of this matter. It is said that peat can be put into such a form, by machines already in existence, that it can be placed in the New York market for three dollars per ton. This is the cost price of placing it there, leaving a pretty fair margin for a profit if it should sell as coal now sells. If the statements which are made are true, every county and almost every town, where peat exists, should have a machine working within its limits. I trust this matter will be fully discussed, and I would suggest that a committee be appointed to investigate the importance of peat as a fuel, to the Commonwealth, the existing supply, and the cost of furnishing it to the market.

I have made these remarks, in opening this meeting, to express my interest in its doings. I regret that I shall be unable to remain and participate in your deliberations; for you can congratulate yourselves that there are gentlemen here who are abundantly able, from their scientific knowledge, to enlighten you, whose presence in the Board will always be a matter of congratulation with the farmers of the Commonwealth, and whose teachings I should be happy to share with you at this session.

On motion of Mr. H. R. Keith, of Grafton, Hon. E. W. Bull, of Concord, was chosen to preside during the day, who, on taking the chair, expressed his thanks to the Board for the honor of being called to preside over its deliberations.

On motion of Dr. Loring, of Salem, the Board then adjourned to half-past two o'clock in the afternoon.

AFTERNOON SESSION.

The meeting was called to order at the hour assigned, by Hon. E. W. Bull, the president, who introduced, as the lecturer for that hour, Charles L. Flint, Secretary of the Board of Agriculture, who offered the following proposition:

The State Farms should constitute great Breeding Establishments for some one exclusive, distinct, pure-bred class of stock.

Happening to pass a few hours at the State Almshouse at Monson during the month of October, the superintendent, after showing me over the buildings, desired me to take a look of the stock at the barn. This consisted of a pure-bred Ayrshire and a pure-bred Jersey bull, a half dozen Ayrshire heifers, a few grade Shorthorns, and something like twenty grade or "native" cows.

It appears to be the intention to cross the Jersey and the Ayrshire stock by way of experiment. That is a good cross, as I happen to know from several cows that I have owned, and in my observation, which has been extensive, I have never known it to fail of producing cows of more than ordinary quality. I do not, therefore, object particularly to this cross.

But I take the ground that it is the duty of our public institutions to adopt the breed of cows best calculated to meet the wants of the locality where the institution is situated, and to keep and increase that, both for their own advantage and for the benefit of the people. Much as I like the Jerseys, in their place, in the butter dairy or on the gentleman's lawn, I do not believe them the best for the supply of milk for these institutions, and, therefore, I would not have them bred there. The Ayrshire is the animal of the greatest thrift on common pastures, producing usually a large quantity of milk; easily kept and very easily turned into beef. Since the breaking up of Peters's herd, last spring, we have no large breeding establishment devoted to them, and attention to the selection and multiplication of pure Ayrshires would prove a source of profit, but more especially a great public advantage.

I admit that for practical purposes, on an ordinary farm, the grades are as profitable as pure-breds; that is, they will give quite as much, perhaps more, if the cross is judiciously taken. But something more should be kept in view by all our public institutions than the mere product of so many quarts of milk or so many pounds of butter. In Europe they do these things better. Large breeding establishments, both of horses and neat stock, are kept up in many countries at the expense of the government, or of the crowned heads who rule, and this is regarded as of great public importance.

Queen Victoria, for instance, has a herd of nearly two hundred Shorthorns established by Prince Albert in 1850, at the Home Farm, quite near to Windsor Castle, and bred with extraordinary care. Another herd of pure-bred Herefords, numbering about ninety, are kept on the Flemish farm, a couple of miles off, and still another large herd on the Norfolk farm, adjoining, of four hundred acres, a hundred head of pure-bred Devons. At the Frogmore dairy, established by Prince Albert, a few Jerseys are kept.

As early as the year 1824, the noble old King William, of Würtemberg, became a purchaser, through agents, from some of the most famous herds of Shorthorns in England, and his public-spirited example was followed some years later, by the Emperors both of Russia and Austria. Nor was the late unfortunate King Louis Philippe of France far behind them, for he made repeated purchases of Whitaker, of Burley, and of the noted herd at Leyfields, and of Lord Spencer , at Wiseton, and elsewhere, for the purpose of securing a change, and the best strains of blood for the perfection of the royal herd. His example was followed by his successor, the present Emperor of France, who has not only hired bulls at great expense of the magnificent herd of Mr. Booth, of Warlaby, but bought thirty cows, a few years ago, at a hundred guineas, or more than five hundred dollars apiece. From the imperial herd, and from other sources, the finest bred males have been distributed in very many of the departments of France.

With the same design, that of introducing improvements into the stock of the country, the King of Sardinia has been, at different times, a pretty extensive purchaser of this remarkable breed, and so has the King of Holland, whose agents traversed Yorkshire to select the best to be had, cost what they would. Spain also has done the same with the design of putting better points upon her Andalusian cattle, and last year Sweden was in the market, in most spirited competition for the best of the English strains, to improve her stock.

Scientific men have long been aware of the immense advantage which science derives from the magnificently liberal and prompt endowment of institutions designed to promote it, on the part of absolute rulers whose will is law. Witness the splendidly endowed observatory at Pulkova, in Russia, one of the most celebrated in Europe, and many others that might be mentioned, vastly better equipped for scientific investigations than those of our own country. Why is this ? Simply because one capable, intelligent mind, devoted to the interests of a great empire, can more easily be led to understand the great importance of scientific and other investigations designed for the public good, and so to make prompt and princely appropriations for them, than a large body of men, like that in our popular form of government, where, if some are far-seeing enough to comprehend the importance of such establishments, many of the others are not, and so there is delay and opposition, and often the loss of appropriations to support them. Witness the treatment, on the part of Congress, of the American Nautical Almanac Office, and other similar scientific enterprises which contribute so much to the honor and glory of the country.

Now the position of the sovereigns I have named as having formed large breeding establishments for the improvement of stock, is not our position, it is true, but the fact that they have adopted this as one of the prominent modes of advancing the interests of their respective countries, is a strong evidence of its great public importance. Of this, indeed, there can be no question in the mind of any intelligent man. And because we have no emperor, no king, no life-long ruler, and don't want one, to do this great service to the public, is it any reason why we shouldn't take hold and do it ourselves for our own benefit? Or rather, isn't it the very reason why we should? We can do it. Every public institution which has a farm attached can do it, and do it well. We have three State Almshouses, and three Asylums, while every town has its poor farm. I hope they will not wait for public sentiment, but go ahead and trust to a just appreciation of their efforts on the part of the people, which is sure to follow sooner or later. To do the thing rightly, they should not experiment with different breeds, but leave that to the Agricultural College, or to enterprising individuals, and select one first-rate breed adapted to the wants of the vicinity, and stick exclusively to that, till a reputation is secured.

The sovereigns I have named as engaged in the laudable endeavor to improve the stock of their respective countries, by means of great breeding establishments, are doing for their people what the people cannot so well do for themselves.

With us the people are sovereign. They have not the permanent individual will at their head to do these things, but every intelligent man can see the importance of such efforts for the public good. Now I say, in want of a better place, the farms connected with our public institutions should keep this object in view. They can do it and not increase the expense, if the officers connected with them possess the requisite skill and judgment in selection and breeding. If they do not, the importance to the public is so great that they should set themselves at work to acquire it.

These suggestions apply not to one, but to all our public establishments that possess farms. Let them make up their minds what breed of cows, what breed of hogs, what breed of sheep, if they keep any, and what breed of poultry is best for the people, say within a radius of ten or twenty miles, and adopt that exclusively, and breed it with the utmost care. It will cost no more to keep pure breeds than grades or scrubs. The product may not be greater in milk, but there is greater certainty of results, and the animals, when they have them to sell, will bring prices enough higher to pay any extra expense of raising, instead of relying upon the public markets to replace their stock as it grows old.

The Deer Island farm, under the superintendence of Thos. E. Payson, Esq., began this with a choice selection of Jerseys, which were designed to form the nucleus of a most valuable herd. It was broken up by an unfortunate visit of the pleuro-pneumonia. I regretted it at the time, and I still say it is a great public calamity to have any such effort nipped in the bud.

I have alluded to the results of my observation of cross breeding between the Ayrshire and the Jersey, as producing generally good milkers, retaining, more or less, the characteristics of both breeds as to quality and quantity. This I think is the general opinion in this country, though it is proper to state that the female has seldom been a pure-bred animal. Few men of any true notions of breeding would attempt the cross on a pure-bred cow. It may be that the base blood in a grade Ayrshire, however high the grade may be, would add something to the good milking qualities of the offspring of this cross, and this is probably the case.

I have in mind, at this moment, two cows of this cross, both of which I once owned, whose dams were high grade Ayrshire, high as three-quarters or seven-eighths, and both of which were remarkable milkers. The sire of the two cows I speak of as coming from such dams, was a pure-bred Jersey. The result was highly satisfactory, but it would probably have been equally so, perhaps more so, if the sire had been Ayrshire, because the dams of both were remarkable milkers.

But the cross has not been successful on the pure-bred Ayrshires in Scotland, where attempts have been made for some years to cross the Jersey with the Ayrshire, in both ways, with the view of imitating the form of the Jersey cow. The results have been to produce in both progenies the inferior points of both breeds, which might, indeed, have been expected, since, as Stephens says, " the Alderney bull has not so good a frame as the Ayrshire cow, nor has the Alderney cow so good a constitution as the Ayrshire bull."

It is proper to mention this fact to show that the cross cannot be regarded as an experiment. It has been tried time and time again and the results noted. No one would hesitate a moment to say that the use of the pure-bred cow in taking a cross between the Ayrshires and the Jerseys would be injudicious. There could be no economy in it, since both breeds ought, from their high character and world-wide reputation as dairy breeds, to be kept distinct and pure. If a man has a good common or grade cow, and wants to make a grade with one of these fine breeds, I have nothing to say against either. But with the pure-bred cow the case is different.

This matter of crossing may be carried quite too far. If the design is to procure animals *for the butcher*, it may be judicious, but when it is to procure *breeding animals*, it cannot be condemned in terms too strong. The principal use of crossing, by which I mean between two distinct breeds, is to raise animals for the butcher, by obtaining increased size and disposition to fatten and early maturity. With any other object in view, crossing is injudicious and to be avoided, especially when all the advantages to be derived from it can be obtained by proper selection of individual animals and keeping the breed pure.

I took the ground, at the beginning of my remarks, that it was for the public interest that all our charitable and other establishments, which carry on a farm as a part of the system itself, should have the good of the people at heart in the breeding of pure stock. They would not, by taking this course, be undertaking any doubtful experiment. The proposition which led to my remarks, namely, the crossing of the Ayrshires with a Jersey bull, implies an experiment, but one which has been tried a thousand times, and settled to the satisfaction of every intelligent stock raiser ; but it also implies that the produce from this cross would be raised, involving as great an expense as the raising of pure-bred calves would involve.

Now when this expense is incurred, and the grades got up to three or four years old, they would be worth little more, and would probably bring no more, than good common cows which could be picked up in the neighborhood, or in the droves from Maine or Vermont. The same expense incurred in raising pure-breds would produce animals that would bring two or three times as much, on account of the blood or the pedigree. Blood has a money value, for breeding purposes, but only pure blood. If there is any taint, if the animal is a grade, no matter what the grade may be, she is to be judged in the dairy, solely on her merits as a milker. A strain of Ayrshire, or Shorthorn, or Jersey blood, is worth nothing in her, as a breeder, unless it happens to give more than ordinary qualities at the pail, and then not on account of the blood, but on account of these qualities. Not so with a pure-bred animal. She may be good, or she may be indifferent, as an individual, but she carries the blood whose characteristics are well known, and if they do not appear in her, they will come out in her offspring, and this gives her a money value over and above that based on her intrinsic qualities as a milker.

There is another objection to the cross proposed, if the Ayrshire heifers are full bloods, as I understood those at the almshouse were, and that is, that after the cross with a Jersey, they would not be fit to breed pure Ayrshires from. They would be comparatively worthless as breeders of pure stock ever after. This principle in breeding is well established. If the animals in question are not pure bloods, it matters little what they are put to, except that, if it is designed to build up a herd of Ayrshires, it would be a great misfortune not to begin and breed up to it as soon as possible.

I cannot too strongly recommend the course I have suggested, that all our public institutions should adopt some one known breed, and stick exclusively to that, keeping only the very best, and breeding it with judgment and care. It would be of great public advantage. The farmer who wants to buy an Ayrshire, knows not where to go find one. The same is true, to a great extent, with each of the other prominent breeds, but it would not be desirable for any institution to undertake to keep more than one breed. Let it have the best and improve it to the utmost. The service of male animals might be free, or fixed so low, to surrounding farmers, that they would be willing to comply with reasonable conditions, such as to raise, or cause to be raised, all heifer calves, and to kill or castrate all males, from grade or "native" cows, or cows of any other breed. In this way the whole stock of the neighborhood might be changed and improved in a few years. I submit these suggestions as worthy of careful consideration. The expense of carrying out the plan need not be great, and the good would be incalculable.

Nor do I see any practical difficulty, of any account, in carrying out the plan I have proposed: that of making the farms connected with our public institutions serve two purposes; first, that of furnishing the supplies of milk for the institutions, which they must have; second, that of breeding establishments for a high class of stock, in which the farming community is so largely interested. To me it seems perfectly feasible. The expense, in addition to the present management, would be too trifling, on the part of the State, to constitute any obstacle. It would mainly consist in getting a right start at the outset, for, as I have said, the cost of raising and keeping pure-bred stock is no greater, or if any, not essentially greater, than raising and keeping grades or "natives."

Indeed, if the system were rightly managed, it might be made a source of absolute profit to the State, if not for the first three or five years of trial, at least in the long run, for everybody who has read the reports of the sales of pure-bred stock, knows it has brought prices far larger and more remunerative than any grade stock would bring under the same circumstances. Take the recent sale of Ayrshires and Jerseys, at the farm of John Giles, at Woodstock, Connecticut, for example, where the six months Ayrshire calves brought on an average $70 apiece, which was admitted to be extremely low, and the Jersey calves $85 apiece. Is there anywhere an instance of a sale of common calves, which brought such prices? Or, take the Ayrshire cows, which sold remarkably low, on account of the adverse circumstances of the sale, and yet they went at an average of over $193, while the yearlings went at the low average of $90. The Jersey cows, at this sale, brought an average of $293 a head, and the spring calves an average of $85, including one bull at $50; or, if we turn to Peters' sale of Ayrshires, last spring, we have a larger average than any of them.

Now, if our State institutions can breed a high class of stock, and have animals of undisputed pedigree to sell, is it not clear that it could, within a reasonable length of time, be made a source of great profit? And let no one say that the demand would soon be supplied. The demand for a higher class of stock is constantly increasing, and in a proportion much greater than the supply. In 1853, there were but about seventy-five pure-bred Jerseys in the State. Now they are numbered by thousands, and yet the price of that stock has increased more than a hundred per cent. since that date, and the supply, at the present moment, is far less than the demand. There are Jersey breeders who can take $50 apiece for all their heifer calves the moment they are dropped, and others who are ready to give that.

But I leave the matter of profit entirely out of the question, as being wholly secondary to the main object the State should have in view, which is the public good, which requires that there should be some central establishments where the farmer may know where to go and get what he wants, in the shape of a good and pure-bred cow, and which should exercise an elevating influence on the character of the stock in the sections where they are located.

The only plausible objection that can be raised, it seems to me, is the fact that to begin to carry out the plan in a manner worthy of the State, would require men at the head of these public institutions who were disposed to give their attention to the matter, interested in its success, and competent to select and cull judiciously, in the matter of buying and selling. I am aware that it requires a peculiar and high class of talent to become a successful breeder of stock. There are few Bakewells, few Collings, few Bateses, even among farmers themselves. I am aware, too, that the men selected for these responsible positions are not apt to be familiar with herd-books, not apt to appreciate the importance of following the strict line of descent, or of resorting to a strain here and another there, to remedy a defective point in stock, and to build up those parts in which an animal may happen to be deficient, by the use of other animals in which these parts are more perfectly developed. All this is true.

But this objection is by no means insuperable. Stock-breeding is an art, upon the study of which it is difficult to enter without becoming fascinated with it. It offers a field for the unlimited exercise of the highest genius and skill. The most scientific physiologist would find in it unbounded scope for the application of all the powers of his mind, while to the practical man on the farm it offers a never-failing source of interesting experiment. If, therefore, the superintendents of these establishments were disposed to enter cordially into this plan, to consider its great importance to the public, and the necessity of taking every step in the right direction, they would soon qualify themselves for it, and take hold heartily to promote its success.

Nor would they be alone in this grand undertaking. There are men enough in the community competent to advise and direct, if it were needed. The appointments upon the boards of inspectors or trustees of these institutions should always be made with some reference to fitness for giving advice and direction in regard to the management of the farms under their control. The interest of the State demands this, even without any reference to the adoption of the plan proposed. It would seldom happen, therefore, that there would not be one or more men to be found on these boards of directors, who would be competent to lend efficient aid, and who would become intensely interested in it.

I have heard of some instances, to be sure, where whole boards of these officers have been appointed without the slightest reference to this important field of their duties, as if the economy of the farm, which has, perhaps, cost many thousand dollars, were of no account. In such cases the farms under their charge, and, of course, the interests of the State, suffer in proportion; but I am quite sure that this feature of their responsibilities will not escape the attention of His Excellency, Governor Bullock, and that he will be disposed to consult the highest interests of the Commonwealth in his appointments, by a due regard to this as well as other departments of public service. With this coöperation on the part of the Executive, the difficulties which, under other circumstances, might prove almost insurmountable, would vanish, and there would be no reasonable ground to apprehend a failure.

I say again, therefore, that, in my opinion, the plan is perfectly feasible. It does not follow, of course, that the public institutions can go into it all at once. It might be difficult to find a whole herd immediately of pure-bred animals of the highest quality, as breeders and as milk producers. It would, probably, be necessary to work up to it gradually, and it might take some time to get up to the point where it would be possible to dispose of high class stock. The main point would be to start right, with one or more pure-bred males, and the best females that could be procured. By watching the public sales, and keeping the run of the class of stock which they proposed to adopt, it could not be difficult to build up several magnificent herds, nor need it take many years to do it. The recent sale that I alluded to afforded a rare chance to found two or three such herds. It may not occur again, and it is a matter of deep regret that some of our institutions did not avail themselves of the opportunity of saving some of the choicest animals to this State. But if the plan is once adopted other opportunities will occur.

As I have recommended the adoption of the Ayrshires at our public charitable institutions, like the State almshouses, hospitals or asylums, and town poor-houses, where milk must be largely produced for the consumption of the inmates, and have indicated a preference for this breed over the Jerseys, under such circumstances, it may be proper to point out the difference in the milk of the two breeds, and why the one is better adapted to the wants of such establishments than the other, even apart from the quantity produced. On this question of quantity of milk given by Ayrshires and Jerseys, under precisely the same conditions, I take it there can be no dispute of the superiority of the former. The Jersey breeders themselves readily and very properly admit this, basing their claim to superiority wholly on the butter-making qualities, or the richness in butter of the milk of Jerseys.

As I like the Jerseys equally well, in their proper place, and rejoice that there are so many intelligent breeders of this choice class of animals, I shall not dispute their claim to superiority in this respect, though I am inclined to believe it to be more apparent than real. That is, the same quantity of milk of the Jersey may send up more rich cream in the same length of time than the Ayrshire milk, and this cream may make more butter than that raised on the milk of the latter breed. And this, in the butter dairy, is an important consideration. But it does not follow that the milk is intrinsically richer in nutritive qualities, although it appears so to the eye.

Let us see. In what does the nutritive quality of milk consist? Is it in the butter, or oily particles, or in the caseine or cheesy elements? Manifestly in the latter. What is caseine? It is a nitrogenous substance, very nearly analogous in composition to gluten, albumen and fibrine. It is also very nearly identical in composition with flesh. From twenty-nine to thirty per cent. of the ingredients of pease, beans, and other highly nitrogenous seeds of leguminous plants, consist of caseine. It is, in fact, one of the most important elements of nutrition.

It is well known that cheese is an exceedingly nutritive substance, more nutritive, a good deal, than even butchers' meat, and this nutritive quality is due to the caseine chiefly, the butter or oily constituents adding flavor and delicacy, what we call richness, to the taste. Now cheese is made from the caseine in milk.

That the nutritive quality of milk is to be found chiefly in the caseine, is susceptible of an almost unlimited amount of proof, but I do not suppose it will be disputed, and therefore I will take it for granted.

In which breed do we find the milk richest in caseine, the Ayrshire or the Jersey? Unquestionably in the former. Take the milk of both and set it in separate pans, in favorable circumstances for the cream to rise. After a sufficient length of time, say twelve or eighteen hours, skim the two specimens, and observe the difference in the skimmed milk. One is still white, the color being due to the caseous matter which surrounds the butter particles; the other is as blue as the sky. There can be no question as to which would make the better skim-milk cheese. One appears to be all water; the other is still rich in cheesy and butter particles.

This appearance of the skimmed milk of the Jersey cow is familiar to every one who has handled it, and I take it there will be no dispute as to the difference between it and the skimmed milk of other cows. But if any further corroboration is wanted of the statement that the breed of cows exercises an important influence on the milking capabilities of the animal, I may mention the fact that Mr. Thomas Scott, of Scotland, had an estate under his management where "there were two farms in hand, which were stocked with a breed of Ayrshire cows devoted to cheese-making. A herd of forty-five Jersey cows was substituted for them on one farm, and butter made from the whole milk, under the direction of an experienced Ayrshire dairy-maid; and after three years' experience it was found that these animals produced more butter from the same land than their predecessors; but, when an attempt was made to convert their milk into cheese, *the weight of the produce was lamentably short of that obtained from the Ayrshire.*"

We know that certain breeds of cows produce a milk eminently adapted to the manufacture of cheese. The Ayrshire is one of them, the Dutch another, and certain Swiss breeds might be named in this class. Other breeds are as eminently adapted to the butter dairy; of these, the Jerseys and the Guernseys, and the little Bretons, or the Brittany cows, might be named. Can there be any doubt as to which quality of milk would be best and most economical to consume *as milk?* If, as I have sufficiently shown, the nutritive elements reside chiefly in the caseine, would not that—independent of the question of quantity—would not that which is richest in that constituent, be most desirable?

Some people have an idea that the milk of Ayrshires is poor in quality, because they do not get so much cream on top, after setting a certain length of time, as on that of the Jerseys. I do not admit this poverty. I admit that the milk of Jerseys sends up more rich cream, in the same length of time, than that of the Ayrshires; but that does not prove that it is intrinsically richer. It proves that the cream rises more readily, and therefore that we get more of it, in a given time. But it does not prove that the milk of Jerseys is better, more nutritive, or more wholesome to drink as milk, or to use in cooking, than that of the Ayrshires. Nor does it prove that the milk of the former is, of itself, richer in buttery constituents than that of the latter.

What, then, constitutes the difference between the two classes of milk, or the milk of the two classes of cows, the cheese and the butter cows, of which the Ayrshires and the Jerseys may be taken as types? I have stated that the milk of the Ayrshire cow is richer in caseine. This is a glutinous substance. The oily particles in the milk are entangled in this glutinous caseine. Through which substance would these oily particles rise more readily and in largest quantity to the surface, through this glutinous and partially impervious body, or through that thinner constituent of milk known as whey or water? Of course, through the water. Any one can see that. Therefore, the fact that the cream rises quicker and in larger quantities on the milk of the Jersey, does not prove that it is really richer, even in butter elements, than the milk of the Ayrshire, but only that, owing to the mechanical or chemical composition of the two kinds of milk, the oily particles in the one can rise freely to the surface, while in the other they are more firmly held in suspension, and rise with greater difficulty.

Now I admit that practically, for butter-making purposes, this characteristic of Jersey milk is important, especially where butter is made from cream; but I also maintain that where the milk is to be consumed as milk,—fed out to the children or used in cooking,—this characteristic gives it no advantage over the milk of the Ayrshire, quart for quart. I might go farther, and say that for consumption in this form, the Ayrshire milk is the better of the two, more healthful and more economical. That it contains a greater proportion of flesh and muscle-forming elements must be apparent, since these elements are to be found chiefly in the caseine. And it is this kind of food that the young, especially, require. Can there be any doubt, therefore, which of the two classes of milk to choose for consumption in our public institutions, where, from the large amount used, the difference becomes important?

I will not argue the point further against the Jerseys or their milk. If any institution prefers this breed, let it be adopted; but where it is, let it be exclusively, and as early as practicable. Let the foundation be laid, and every effort made to work up to a pure herd as fast as possible. This is the great point, so far as the public good is concerned, to have certain breeding establishments of high character, where a farmer can go with entire confidence and get what he wants at a reasonable price. I want to see the thing begun, and begun rightly, and carried through to the results.

I have alluded to the Ayrshires because I believe them, all things considered, to be the best adapted, not only to most of the farms to which I have alluded, but also to the neighborhoods in which most of them are located. But if there is any locality where the Shorthorn would thrive in perfection, as possibly at

Northampton, I should be glad to see that adopted, though from my knowledge of the farm connected with the hospital there, I should be inclined to doubt its economy.

It is proper to say that at the Insane Hospital at Taunton they have for some time had Shorthorns which have repeatedly been shown at the exhibitions of the Bristol Agricultural Society in that town. No doubt the original intention on the part of the managers of that institution was correct, but it so far fails to come up to my ideas, in that the breed adopted is not one well calculated to meet the wants of the farming community of that section.

I wish, however, in the most emphatic manner, to say that Dr. Choate, the efficient superintendent, is entitled to the credit of introducing the policy of keeping only pure-bred stock of a high character at the institution. And as the soiling system was to be adopted as a matter of necessity, on account of the poverty of the pastures at that time, it made no difference, so far as the interests of the institution alone were concerned, what class of stock was adopted. It should also be stated that at the time this policy was adopted, more than a dozen years ago, there was less general information as to the comparative merits of the distinct breeds of stock. If the decision were to be made now, I have not the slightest doubt the choice of a breed would be different.

I am not familiar with the farm connected with the hospital, nor have I examined the stock it produces. It may be that the land and the grass are now so luxuriant that this breed can be supported upon them; but no one who knows anything about the land and the farming of that county, can pretend for a moment that the Shorthorns are well adapted to its wants.

In taking this ground, and making these remarks, I wish it to be understood that I have nothing to say against the improved Shorthorns as a breed. They are magnificent in their proper place, upon the flat, rich and luxuriant pastures of old England, and upon the level bluegrass ranges of Kentucky, nor do they fail of a fine development upon the splendid pastures of the Connecticut Valley. If I were engaged in stock farming in either of these localities, I should probably adopt them and make the most of them, especially of their beef-producing qualities.

But in all our farming operations we should study nature and try to conform to her laws, instead of setting up a constant struggle against them. Nature has the advantage of us in having plenty of time to work out her problems, and in the end she is sure to win. Nature never made a perfectly developed Shorthorn cow, nor a Cotswold sheep, on Plymouth or Bristol County pastures, at least on the average of them. I saw two specimens of what were called Shorthorn bulls at the Plymouth show, but the owners were evidently deceiving themselves. I regretted that they could not be placed, for the sake of popular instruction, alongside of the magnificent specimens at the English or the Kentucky shows. Nothing could have been more striking than the contrast which they would have presented. Nothing could more clearly have demonstrated the folly of attempting to force this class of stock in such localities. It can't be done; and the sooner it is given up the better will it be for the purses of those who try it.

Now, if the institution at Taunton wishes to breed for beef, as we have a right to infer from the choice of the beef-producing breed, why not take the Devons, a class of animals vastly better adapted to the locality, and so do something to encourage and improve the stock interest of the county? It certainly cannot be for the interest of the farmers of that neighborhood to attempt to enlarge their stock by an infusion of Shorthorn blood. They are large enough for their pastures already. It is for their interest to breed small cattle, such as can fill themselves easily, or with comparative ease, on their light pastures. Every step they take in the way of enlarging the frames of their stock, is a step in the wrong direction. And if they don't know it now, as I think they do, they will soon find it out. The Devons would stand some chance of making a fine-grained, well marbled beef, and of attaining to fine points as compared with the Shorthorns, and for breeding for beef or for working oxen, perhaps they could not do better. The example of the institution would, therefore, be vastly more salutary, if it should adopt this breed instead of the Shorthorn, both of which are bred chiefly for the same purpose, for the butcher.

But I incline to think the kind of animal best adapted to that section is the Ayrshire, unless it be on a few farms which may be devoted chiefly to the butter dairy, where the Jersey might serve a better purpose. If this is the case, if a small, hardy, thrifty cow is wanted, one that will give a large quantity of good milk for the amount of food required, then it is clearly the duty of the institution to set the example, and to consult the interests of the community, by adopting one of those breeds, and bringing it within the reach of the farmers there. I speak advisedly on this point, for I have seen the Shorthorns on their native meadows, and the Ayrshires too, as to that matter, and I know that however well they can be developed in the vicinity of Taunton, they cannot be made to compare at all favorably with the same breed under circumstances well adapted to its full perfection. And what satisfaction can there be in keeping a class of cows where they do not, and never can belong?

But we may be told by the farmer of the Taunton hospital that they get a large quantity of milk from their Shorthorn cows. Quite likely. Some Shorthorns so far depart from the general and acknowledged characteristics of the present modern *improved* breed, as to give a good yield of milk. But it is seldom that such animals can compete in the show-yard, with any success, with those that do not milk well. Milking qualities are not the standard by which this breed is judged now-a-days, because it is rarely the case that it is bred with any reference to them. I admit, too, that it makes grand crosses, especially in a cheese-dairying section, where the pasturage is abundant; but that does not affect the question in Bristol County, nor prove the policy of trying to keep the breed there. The real question is, whether or not, as a breed, it is adapted to the wants of small farmers on thin, light farms, such as those most commonly found in that part of the State? If it is not, then I say the institution is not accomplishing its work, or the work which, as a public establishment, it might and ought to accomplish, in improving the stock of that section of the State.

The course I have advocated, as that which should be promptly adopted on the part of our public charitable institutions, is one, the importance of which can hardly be overestimated. It offers the means of developing and improving the stock interest of this State to a vast extent, as it would bring the means of improvement within the easy reach of a large number of enterprising farmers. It offers the means of creating a greater uniformity in our stock, and of laying the foundation of a desirable reputation for dairy cattle, which would be worth a good deal to us, to say nothing of increasing the productiveness and economy of our herds. Ten years would scarcely elapse before the prevailing character of the stock of whole neighborhoods would be changed, and, in most cases, vastly improved. Is it not worth an effort, especially as it could be accomplished with so little outlay to the State?

I cannot see how the suggestion can fail to commend itself to the favorable consideration of every reflecting man who is at all capable of appreciating the importance of it to the community. I want to see the plan begin and begin rightly. "Well begun is half well done."

In conclusion, the following Resolutions were offered:

1. *Resolved*, That in the opinion of the State Board of Agriculture, it is the duty, and for the interest of the several public institutions, to which there are farms attached, as a part of the system of State and town charities, to adopt the plan of keeping and breeding only one class of pure-bred stock of a high character, of each of the species kept by them, to be selected with reference both to the wants of these institutions and of the farming community in the sections where they are located.

2. *Resolved*, That, in the opinion of this Board, this course would be for the pecuniary advantage of the public institutions, and of the highest importance to the agriculture of the Commonwealth.

3. *Resolved*, That, in the opinion of this Board, the Ayrshire cow offers the greatest inducements to such institutions throughout the middle and eastern part of this State, as aim to produce milk for the consumption of their inmates, and as being the animal best adapted to the wants of farms in the sections where such institutions are located.

4. *Resolved*, That we will do all in our power to promote the recognition and adoption of this plan as one well calculated to elevate and develop the stock interest of this Commonwealth.

Mr. Stedman, of Chicopee.—I move that the Resolutions be taken up and acted upon separately.

The motion was agreed to, and the first Resolution was read.

Mr. Stedman.—I agree with the Resolution in the main; but there is one clause to which I must dissent, and that is the clause which confines the selection to a single breed. I noticed that idea in the lecture, and felt that the subject might bear discussion, whether we are to attain the most desirable results in comparing the different breeds, by having but one breed at one institution and a different one at another institution. I might keep a herd of Ayrshire cattle, and keep them in an indifferent manner, so that they should not fully develop their qualities, and yet, if there were no other, they must stand as the representatives of that breed. You might adopt the Jerseys, and by keeping them with proper attention and care, far excel the produce of the herd of Ayrshires. Are we to conclude, from experiments of that kind, that one breed is better than another? It seems to me that we must have two or more breeds kept together, under the same sort of treatment and the same circumstances. Because, as every gentleman will see, the circumstances in the different institutions will be so different that nothing reliable can be attained.

I have long felt that there is a need of some point where the different breeds can be brought together and tested together, under the same circumstances and treatment in every respect. This can be done only under the guidance and direction of a single individual.

Dr. Loring, of Salem.—I desire to say a word, in answer to the gentleman from Chicopee. It seems to me that the Resolution offered by Mr. Flint meets the case exactly; for, if Mr. Stedman, or any other gentleman of the Board, will go through the State of Massachusetts, he will find the different breeds of cattle in almost all the institutions. No farmer has one specific breed. On the contrary, you can go into the best dairies, or the best breeding farms in the State, and you will find, right alongside, as diverse animals in breeding and shape as possible. The experiment which Mr. Stedman wants tried has been going on, and we have tried it perfectly. It seems to me we had better develop one breed in one place, the best way we can. No one man can do everything; and no man that I ever knew had the genius to breed Ayrshires and also the Shorthorns. The business is just exactly as different as it is possible for two things to be, and the rule that applies to a good Shorthorn is entirely different from the rule that applies to a good Ayrshire.

In the first place, the shape of the animal, and in the next place the object for which you breed; next, the way in which the young animal should be reared; next, the way in which the old animal should be fed; and next, the way in which you shall arrive at the conclusion at which you wish to arrive. It would be absurd to rear and feed a young Ayrshire according to the method adopted by the breeder of Shorthorns. In that way you would make the Ayrshire as far from a good dairy animal—excuse me, Mr. Stedman—as a Shorthorn. You can make the Ayrshire a larger animal, and a full, round-legged animal, as well as a Shorthorn. You can make an animal take on bone or fat, as well, if an Ayrshire, as a Shorthorn, if you appeal to the bone-growing and fat-producing qualities. The art of feeding Ayrshires is to devote your efforts to feeding for the production of milk. The functions of the animals are different, and, therefore, the feeding, should be different. The Ayrshire should be fed upon that kind of food which will develop milk, and my word for it, you will have a good cow, if you feed right and breed right.

The breeding and feeding of Shorthorns, and all other breeds of animals, is a very delicate matter. This cannot be done by mixing animals of various breeds together, or by congregating them under one roof. A collection of Shorthorns and Devons and Ayrshires and Jerseys on the same farm, cannot be bred with advantage to either. Mark the difference between them. In the one case you breed an animal with small cylindrical carcase and preponderating quarters and shoulders, and you get an animal for beef. In the other case, you breed an animal with large, capacious carcase, and small quarters and shoulders, and you have one fitted for the dairy. It is difficult to carry on these two methods of breeding on the same spot and under one eye. It is, moreover, impossible to keep the various breeds together, without their exerting an influence on each other. The peeled rods of Jacob have not yet lost their effect. When I advanced this thought last year, you all remember how admirably Professor Agassiz sustained it by his own observations made in Switzerland. I would avoid such consequences as the companionship of the various breeds with each other would produce. The breeds must be kept apart; they must have no physical nor spiritual influence upon each other. Why, your hospitals would become literally lunatic asylums, and the inmates of the hospital would be matched by the inmates of the barn, if you undertake to mix up these things as has been proposed.

I trust the Resolution will prevail, and that we shall have some place where we can go and learn how to breed cattle, each in its own appropriate way; where men can go and know that they get a pure-blood animal; where they can go and learn to what treatment the animals have been put, and under an intelligent eye.

I know that Mr. Flint is laying a great burden upon the farmers of these institutions. But somebody has got to look after this matter, and look after it well. If we can get the men, let us set them at work. How they shall be obtained, I do not know. But let us have them, and then if a gentleman wishes to know how to breed any particular stock he will know where to go to get it.

With regard to the best breed for the State of Massachusetts, every gentleman who knows me knows my views; but, at the same time, whether the State Board of Agriculture is ready to declare it, is another matter. I hope the first Resolution will be adopted.

Mr. STEDMAN.—The gentleman from Salem seems to have looked at me as the Shorthorn breeder. It was not with reference to myself, in that respect, that I rose to speak upon the Resolution before us. I would confine my remarks to the two breeds specially mentioned in the lecture by Mr. Flint. I might have a purer breed to outstrip me, just as the gentleman from Salem, having a knowledge of law and medicine and politics, can outstrip me in argument, and make the worse appear the better side. He has alluded to the great variety of mixed breeds scattered throughout the State of Massachusetts. That is not the class of stock with which we wish to experiment. We wish the pure breeds. Was I not correct in the statement that we now know which is the better, by their being kept, one here and another there, under different managements and under adverse circumstances? I have long felt it was a want that we should have some place where the two breeds, or some two, should be bred together. I do not say that they should be confined in the same yard. It would be best, certainly, to have the males and females of the different breeds kept apart. There is room enough for both breeds to be raised together, and I really hope the Resolution will be so amended, that it will allow of introducing two of the breeds together, where they can have the treatment of the same person.

Prof. PAUL A. CHADBOURNE, of Williams College.—While listening to the remarks of the gentlemen who have preceded me, I thought this was going to lay a great responsibility upon the superintendents of our public institutions. As these institutions are not founded for such a purpose, we can scarcely expect them to do many different kinds of service. But if they will take one specific kind—if they will each of them do it—we shall have institutions near enough to have a sort of comparison.

But I understand that we shall have an Agricultural College where this business of experiment should be carried on on a larger scale. The business of that college will be to attend to this matter on a more extended scale, and while these other institutions shall take one breed, and that which is best adapted to the vicinity, the Agricultural College will bring different breeds together in such numbers that you can have a herd of Jerseys, and a herd of Ayrshires, and of Shorthorns, if you please, and still keep them entirely distinct, though under one herdsman. There you can have the very comparison to which Mr. Stedman has referred. I consider the point to which he referred to be one of great importance. The only question with me is, Is it possible for these institutions, which are founded for another and an entirely distinct purpose, to so far turn aside as to take up the rearing of two or three distinct herds, and bring out the peculiarities of each? Would it not be better to confine them to one distinct breed?

MR. KEITH, of Grafton, asked Mr. Thompson, of Nantucket, to give the result of his experience with Ayrshires.

Mr. THOMPSON.—I think it is asking rather too much of me to give my experience in raising Ayrshires, as I have not owned the breed long enough to instruct gentlemen who have owned the stock almost since I was born. My attention has been turned to the Ayrshire breed particularly. After looking at breeds from one end of the State to the other, almost, I succeeded in obtaining Ayrshires; and I think I got the right kind. I have been into a number of herds. I have seen the herds of

Mr. Peters, Dr. Loring, and Mr. Stone. They are all beautiful animals, adapted to the purposes for which they raise them. There is no doubt they give a large quantity of milk. As to the quality, it is not for me to say; I can only judge from the actual comparison of the product, one with the other, and of the making of that product into butter, and also of the disposition of the consumers to purchase one variety rather than another.

I succeeded in getting some Ayrshires, and also some Jerseys. I meant to go until I got them from the best herds I could find, of each class. I think I succeeded. There is no doubt but that the Jersey cows increase in quantity of milk, and in perfection of form very much by breeding on themselves over and over, after they come into this country. I have seen the Jerseys as they were imported, and I have seen their offspring increasing in beauty of form, till I have a heifer now in my barn that is as pretty in form as any animal I ever saw. She is a Jersey, but a finely formed animal. I have an Ayrshire also, of as beautiful a form as can be. I will admit she is more barrel formed. Put them in a pasture, side by side, and the Jersey will lie down first; and if at the barn the Jersey will fill herself and lie down first; of the food that they consume the Jersey will eat the least. Feed them with the same quantity of meal, and the Jersey will eat less. Carry the milk to each house, or let the customers come and buy, and after a short time they will say, "Can we have the Jersey milk?" "No, we want it for butter. We will sell the Jersey milk for eight cents a quart, and the Ayrshire for six cents." "Give us the Jersey milk," they say. When we make the cream into butter, it is made with half the labor. We make a pound of butter with from five to seven quarts of milk. I do not want to say anything about making the Ayrshire milk into butter; it will take too long to churn it. It is just like the milk taken from the herds, taken promiscuously. It is very sweet, and there is a great quantity. But with the Jersey milk you have simply to draw a knife around the cream in the pan, and with a fork roll it up. That I have done within a week.

I like the Jerseys very much for the island of Nantucket. I am in hopes to establish that breed wholly upon that island. I have a herd of seven myself, and there are half a dozen more around me. I carried them all there myself. One Jersey cow, belonging to a neighbor, gives seventeen quarts of milk at calving, and will give from seven to nine when she comes in, while the best cow that he brought there from his farm will go dry two or three months.

I started with as good a herd of Ayrshires as anybody could start with. I got the bulls out of as good a stock. There are some here who have seen both breeds of mine, and they know there is one Jersey among them that is as pretty a formed cow as the Ayrshire. She was out of a cow imported by a friend of Webster, and presented to him. She has been crossed long enough to attain the handsome form that they acquire in the eastern part of the State. I saw some as handsome, in Concord, N. H., as I ever saw anywhere.

I do not wish to leave the impression that I despise the Ayrshires, or the one breed or another. I think that if the institutions do adopt any one particular breed, that one should take the Jerseys and another the Ayrshires, and that the one at Northampton should take the Shorthorns. I think the three breeds should be bred at the different institutions; and if it is necessary for the comparison to breed them side by side, do that at the Agricultural College.

The PRESIDENT.—The chair would remind gentlemen that the Resolution does not raise that question, but simply requires that the public institutions should each be made a breeding centre of some particular kind of stock, to which the public can go and obtain pure animals without paying speculative prices.

Mr. STEDMAN.—I think the gentleman from Nantucket (Mr. Thompson,) has presented the case exactly. He started with Ayrshires alone. Would it have been wiser to keep only that breed than to bring in the Jerseys and compare them? He did just what I wish to see done at the public institutions, so that they can be subjected to the same treatment.

Mr. FLINT, Secretary of the Board.—I suppose it is well known that our public institutions are not very well calculated to conduct a series of experiments in a satisfactory manner. I do not know a single State farm where I think it would be judicious to undertake a series of experiments as to the character of the different breeds of stock. It seems to me it is not the place. In the first place, they have a duty to perform which is the highest of any, which is to raise a sufficient quantity of milk for the institution. They could buy. But it is not for the interest of the State to buy when the farms can raise it cheaper. I think they can. If it is profitable for any farmer to raise milk, it must be for the State, which owns these farms, as it can not only furnish the milk, but has an abundance of economical labor to work the farm. If it is for the interest of the State to own farms, it is also for its interest to raise the milk for these public institutions. If they are to do that, they can hardly be expected to experiment to find out which breed is best. Everybody knows which is best for their purpose. They want to raise milk, for the children to consume. They are not butter-making establishments. With few exceptions, they make but little butter, and that perhaps for the family of the superintendent. The main object is the production of milk.

I am as strenuous as Mr. Stedman or any one else can be for a proper series of properly conducted experiments. I think individuals can conduct such experiments better than State almshouses. If it were suggested to them that it was an experiment that they were to try, it seems to me there would be an objection on the face of it, as they must exert their energies in a different direction.

Before I sit down I ought to state that I did not offer these Resolutions because I was at all strenuous that they should be adopted in the particular form in which they were presented, but simply that the subject might be brought before the Board.

Mr. Stedman.—How can these institutions ascertain which kind of milk is best for the institutions? If they raise Jerseys, perhaps if they make the milk one-half or one-third water, it might be as well as to raise Ayrshire stock.

Mr. Flint.—Enterprising breeders have been devoting attention to this subject for fifty years. It seems to me they must have arrived at some conclusions that are worth something. And if there is one thing better established than another, I suppose it is that which relates to the qualities and characteristics of the different kinds of stock. It seems to me they are well known.

With regard to the experiment of Mr. Thompson I will not make any suggestion. But Mr. Thompson would not say that the experiment which he has made, extending over only a few months, and with less than half a dozen animals, constitutes an experiment. I do not suppose Mr. Thompson considered the experiment as conclusive. He simply brought it up as the result so far as he had gone. Everybody knows it would be very unjust to judge a breed by one, two or three animals. Mr. Stedman would not agree to have an experiment depend on such a comparison. But we know, from what we have ascertained, generally, of a breed, what are its characteristics. They are probably as well known now as they will be fifty years hence. The results are perfectly well known, not only in this country, but abroad, where experiments have been tried in an infinite variety of ways. We may take it for granted, that the Ayrshire cow, as a breed, produces more milk than the Jersey cow. I do not say there are not individual Jersey cows that will give more milk than individual Ayrshires. But as breeds we know perfectly well what both breeds are. The drift of my remarks, in the paper just read, was to show that the Ayrshires were the breed to produce milk, to supply our public institutions, to be consumed as milk, nor did I intend to decry the merits of other breeds, which are all excellent in their place.

The first Resolution was then adopted.

The second Resolution was read and considered.

Mr. Stedman.—I wish to explain that I do not see how the agriculture of the State is to be benefited by that which is no experiment.

Mr. Flint.—In the first place, every institution would have to keep one or more bulls. These bulls would be free for the use of the farmers in the vicinity, on condition that they would sign an agreement to raise all the heifer calves, and kill or castrate all the male calves. In the course of nine or ten years, if the plan were adhered to, the whole of the stock in the neighborhood would be improved, and you would get a class of stock which, for practical purposes, would be as good as pure-breds. That would be an important advantage to the agriculture of that particular neighborhood in a circle of five, ten or twenty miles around.

Suppose these institutions had begun, ten years ago, when the system of our State almshouses commenced, with one or two Ayrshire bulls and pure Ayrshire cows, and that they had bred these animals judiciously and properly; by this time they would have had large herds of pure Ayrshire cows. These cows would have produced as much milk, and of as good quality, as any other cows. I have shown, by the sales of Mr. Peters' herd, as well as others, that the pure-bred cows would bring three or four times as much as our best quality of common cows. Now, if each of these institutions had a herd of twenty or thirty cows, they would be constantly selling to the farmers throughout the State. If any one wanted a pure-bred animal, he would know where to go to get one; as the State would have no object to breed any but pure-bred animals, and the superintendent would have no object but to do his duty in carrying out the purposes of the State, it seems to me very clear that it would be of great public advantage, and equally clear that it would be for the credit and interest of the institutions themselves.

Mr. STEDMAN.—I admit it would be of advantage; but the question is, whether it would not be a greater advantage if they had two kinds of stock?

Mr. FLINT.—Take the case of Daniel Webster's stock, for example: At the sale of that stock, which I attended, there was not a man who had any confidence in the purity of either of the breeds. The question was, "Who can tell whether that is pure or not?" Who can tell, where there are two or three kinds of stock, and perhaps a common laborer to take care of them? The superintendent would have to stand over them half the time to be able to swear that the produce was pure-bred. Mr. Webster's cattle went off for a song, comparatively, even those reported to be pure. The thing is impracticable. If there were two or three kinds of bulls kept at these institutions, there would be a want of confidence in the community around, in the purity of the stock; and that would make the sales slow and at much lower prices. I think the matter will bear pretty close examination, and that the argument is most decidedly in favor of one particular breed, and no other.

The second Resolution was adopted, and the third was then taken up for consideration.

Mr. STEDMAN.—I move to strike out the word "middle," and modify the language so that the Resolution shall apply to the eastern part of the State only.

Mr. DAVIS, of Northborough.—I hope the amendment will not prevail. My experience leads me to favor the Ayrshire. The experiment has been tried at the State farm. We have had

Devons, Jerseys, Herefords and Ayrshires, at the same time, and all except the Ayrshires have been discarded. The Jerseys did not stand the ordinary keeping. Nothing bore the test so well as the Ayrshires; and of late years they have adhered to them, and have a tolerably good stock. That was commenced by the trustees, and then the State Board introduced the bull Metacomet. We then had Mr. Drake's bull, and I had some imported by Mr. Randall, of New Bedford. So that we have had in that immediate neighborhood a considerable number of bulls introduced, and they have gradually affected the stock in a wide circle in that neighborhood. I do not think you can go into any farmer's barn there and buy a high grade Ayrshire cow quite as low as you can a cow of any other breed. We send milk to Boston, and do not make a great deal of butter. I think the Ayrshire milk bears transportation better than any other. It is necessarily about twenty-four hours old when it reaches the market, and it is in better condition for the consumers then than any other milk.

We have no doubt that the Jersey milk is richer; and if it is simply the butter quality that a family wants, I have no doubt it will produce more than the Ayrshire milk. But if milk is wanted, I am convinced, from sixteen years' experience, that the Ayrshire cow is the cow for Worcester County.

A gentleman inquired if the Shorthorns had been tried at the State farm, to which Mr. Davis replied that he did not remember. But all that had been tried had been sent away, except the Ayrshire breed. The Shorthorns are considered ill adapted to that locality.

Mr. Stedman.—It seems to me that the Board are not prepared to decide that the Shorthorns are not the proper breed for Worcester County, unless we are prepared to go against the experience of the farmers of Barre and Hardwick, where for many years they have been breeding that stock, and possess some of the finest cows in the State. The town of Barre, with regard to cows, is what Middlefield is with regard to cattle—the banner town. I do not believe that the Board are to discourage the Shorthorn cows, with their large, elegant udders. I believe there are more of the Shorthorns in Worcester County than of any other breed. It was with this view that I made the motion to amend.

Mr. Thompson.—I hope this Board will not commit itself to the breeding of any one class of stock; I hope we shall not say to the farmers of the Commonwealth or of New England that we have the *ne plus ultra* in the Ayrshire, and that no other is fit to be raised. I hope we shall let every farmer continue to act his pleasure. The statement of the gentleman from Northborough, (Mr. Davis,) is diametrically opposite to my experience. When my Ayrshires are let out to drink, at the pump, in cold weather, they could not be milked for fifteen minutes after they got back into the barn again, they would tremble so badly; but you could sit down to the Jerseys at once and milk them as readily as at any time. That is my experience. I do not wish to say that the experience of the gentleman from Northborough is not of any value, although it is diametrically opposite to my own. I think it may be well to take one breed at each institution, and breed them up to the highest perfection possible, having different breeds at different institutions, and then the farmers in the different districts can go and select from such as they wish. I went to every herd there was in the State to see the cattle, and in the way I have suggested, farmers could visit different select herds and judge for themselves. If a man is able to judge of his pastures, he can judge what breed will suit his locality best. In Nantucket, where the thermometer goes ten or fifteen degrees below zero sometimes, is the place for the Jerseys. I think our island compares well with the island from which they came, and that they are the most hardy cattle. As to the milk, every man must judge for himself, and whether he wishes to breed cattle for butter or cheese, or to furnish milk for the institution where the stock is bred. I am satisfied that both kinds of butter will bear transportation. I have seen butter made from Jersey cows' milk kept five months, boxed up. There was no perceptible difference as to the souring of the milk in our dairies; I did not hear the remark made that one would sour and the other not. I hope we shall not make any expression that will give the farmers a clue to the idea that we are favorable to one rather than the other.

Mr. Flint.—I wish to repeat that I am not at all strenuous that the Resolutions should be adopted, in the form in which they are offered, nor that the third Resolution should be adopted at all. My main object has been attained, which is, an expression of opinion that it is better for each institution to have one specific class of stock. Each institution can select that which, on the whole, all things considered, is best for the farmers in the neighborhood; and not that they should select a breed arbitrarily, and force it along. I do not suppose any one would say it was judicious to try to keep Shorthorns at Tewksbury, or that they could not be kept at Northampton. I am glad that the institution at Deer Island is going into the breeding of Jerseys. They are also beginning a herd of pure Jerseys at the Farm School, on Thompson's Island, in Boston Harbor. I am glad of it. It is the principle that I wish to have acknowledged, and I shall have no objection to withdrawing the third Resolution.

Prof. Chadbourne.—I think this discussion has taken a profitable turn, and I agree that it is best for this Board not to commit itself to any one breed; for it is evident that there is much yet to be learned. Let each select one breed and test it to its utmost, and let the data multiply, and by and by we shall have more correct results, because, although the characteristics of the breeds are well understood, yet I see from the discussion there are some important points to be settled.

I understood the gentleman from Northborough to say that when the milk of the Ayrshire was carried to Boston it was found in better condition than other milk; and I understood the gentleman from Nantucket to say that he discovered no difference between the milk of the Ayrshires and of the Jerseys in respect to souring; and another gentleman suggested that it took a longer time to churn the cream from the Ayrshire than from the Jersey milk. This shows that the buttery particles, in the milk of the Ayrshires, are entangled in the caseine, and that the milk can be carried to a long distance better than that of the Jersey cows. Perhaps one would not sour sooner than the other; but the milk of the Ayrshire has so much better emulsion, as we used to term it when I studied the apothecaries' business, that it will bear to be carried without separating. That is a good characteristic for milk to be transported, but a miserable one for milk from which you wish to make butter. I have been exceedingly interested in this discussion. I should be glad to have the experiment tried with reference to skimmed milk; let it throw out all the cream, and then try it and see what is left after all the butter has been taken out that is possible.

In selecting milk for children, I should choose that of the Jersey cow for young children, because there is so much of the caseine in that of the Ayrshire. But when a child can eat beef, then give it Ayrshire milk. In the mother's milk the child takes cream with a small amount of caseine.

Mr. Flint then withdrew the third Resolution.

The fourth Resolution was adopted without debate.

EVENING SESSION.

The Board met, agreeably to adjournment, and the session was occupied by the following lecture.

AGRICULTURE AS AN EMPLOYMENT—ITS DIGNITY AND REQUIREMENTS.

BY PROFESSOR P. A. CHADBOURNE.

There is in the public mind a standard by which all employments are ranked. And while money is as powerful with the American people as it is with other nations, it is not the only consideration, nor by any means the highest, in the choice of a profession. Men may feel compelled to labor simply for a livelihood, but where they are able to do it, we see the best of parents choosing for their children, and the best of young men choosing for themselves that profession or business which in their judgment ranks among the highest. It is therefore proper that this Board should consider farming as an occupation. We are all satisfied, I doubt not, of the rank which it ought to take among the occupations of men. It becomes us to inquire whether it really occupies in the public mind the place which it ought to have, and what are the conditions by which the business of agriculture shall maintain its proper rank among the industrial pursuits of this Commonwealth and of the nation.

The object of agriculture is well understood. It is to increase the fruits of the earth. The most valuable products do not spring from the earth spontaneously, or if there is some spot where every kind of plant would grow, there is no place where our apples and pears and grapes, garden-plants and grains, would become as perfect in a wild state as they do under the fostering care of civilized man. As man does not reach his highest state in savage life, but only under the influences of civilization, so the plants most useful to man show that they were made for cultivation, since their excellences are developed only under the conditions which civilized man can give to them. Our finest fruits, our vegetables that render our gardens such luxuries, our grains upon which we so much depend for food, would, if transferred at once to a nation of savages, although possessing the same soil that we possess, either die out, or, in a few generations, the choice varieties would mainly disappear. In other words, the fruits of the earth, which are the object of agriculture, keep pace in their improvement with the improvement of the human race, for which they were created. They were not created to grow wild, like certain berries and fruits, but they were made to be cultivated, and man was made to cultivate them. We thus find this great agricultural truth revealed in the very nature of these plants, and in the delight of man in their cultivation; which delight increases just in proportion as he rises from the low plane of savage life to the higher and still higher planes of civilization. We say then that we have in the very law of vegetable growth and improvement, and in the increased interest of man in the cultivation of the earth, as he himself becomes more cultivated, the highest argument that can be deduced from nature that agriculture is not only the necessary employment of a portion of civilized men, but that it fully meets their wants and capacities, and is worthy of the highest civilized state. In other words, agriculture is divinely appointed as a natural and honorable employment for man in his highest state. And here we find another of those coincidences between the teachings of Nature and Revelation. We have in the Bible what claims to be a history of the creation and early condition of the race. Adam, according to the Bible, was not created a savage to live in caves and slowly to make his way up to a higher life with stone hatchets and oyster-shell hoes. He was not only created in the image of God, but he was placed at once in surroundings worthy of so exalted a personage.

"*And the Lord God planted a garden eastward in Eden, and there he put the man whom he had formed.*

"*And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food; the tree of* *life also in the midst of the garden; and the tree of knowledge of good and evil.*"

Thus it seems that our forefather Adam was started in life under the most favorable conditions. He was created and started in life as a farmer, and he had presented to him at once a "model farm." I suppose that theologians in general agree that it is the duty of man—in fact, the work of the race—to get back as nearly as possible to that blissful state which Adam enjoyed in *Paradise*, and it seems to me just as plain that the great effort of agriculture is to bring this earth back as nearly as possible to that only perfect model farm—the Garden of Eden. We have no lengthy description of this garden, but, as in all Bible descriptions, a few bold lines put us in possession of all the information which we need. "*And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food.*" We learn from this, that *utility* and *beauty* were joined together in this great model farm; in fact, the trees that are pleasant to the sight are mentioned first, as though they predominated, or that beauty was the predominant element of Eden. There was no stint in numbers. Every beautiful and useful tree was found there. There must have been hills clothed with goodly cedars, valleys shaded by lordly oaks, plains fanned by feathery palms, glassy lakes dotted with lilies of alabaster and gold; the blushing rose and modest violet, delicate fern and tufted moss, all were there; and mingled with them all were trees and herbs yielding choicest fruits.

There is no spot like this now in the wide world—no spot that approaches it, except where the soil has been subdued by human toil and watered by the sweat of the face. To come back from the contemplation of Eden, to look out upon our earth, is like descending from the giddy, airy heights of poetry to the stern realities of the common world—like the passage from the roseate dreams of childhood out into the cold, selfish atmosphere of everyday life.

Eden is known only in history. It is with the rugged earth that we have to do. And notwithstanding the curse of thorns and thistles, of frosts and mildew and blight, there is enough of fruitfulness and beauty in the uncultivated valleys and mountains to encourage us to labor to subdue and till the earth.

I invite your attention first to the dignity of agriculture as a pursuit. This is a fertile theme for declamation, and the loudness of the assertions, with the readiness with which the sons of farmers quit this honorable pursuit to engage in what they profess to consider the inferior duties of the merchant, the doctor or lawyer, show that there is a marked difference between our preaching and practice—that there is need, year by year, that the dignity of agriculture should be fully vindicated. We find the first evidence of the dignity of agriculture in the fact that it is God-appointed. There is no other secular business enjoined upon man. Other employments are necessary, but only as adjuncts to this. The cultivation of the earth was the appointed work for man in the pure and holy state in which he was first created. As Adam was the highest type of man, so his employment is that to which all men naturally turn in the highest state of society.

The inherent dignity of the occupation is seen also in the fact that it is the only one that all men may engage in without any feeling of humiliation. We should hardly think it congruous for a king to leave his throne, or the president his chair of state, and engage in the struggles and speculations of trade, or in any of the learned professions, except in the sacred office of the ministry. But the king and the president may both cultivate the earth; they may earn in the field their bread by the sweat of the face, and no one thinks of its being out of place. The high and noble, the learned and the brave, have, in the cultivation of the earth a sure employment, which the whole world regards as honorable.

Another ground of its inherent dignity is the fact that it is the foundation of all the other pursuits. The support of life, food and raiment, are the first great necessities of the race. These come from the earth. Our railroads thunder along with their loaded trains, but the cars are filled with the products of the earth. The canal is bearing on its fleet of deeply laden boats, but it is the amber wheat and golden corn that so deeply sink the keel. The ocean is shadowed by ten thousand sails and ploughed by mighty steamers, but in all their rich freights, how small a portion can be found that is not a product of the soil! The grain of the North, the cotton and rice of the South, the fruits and spices of the islands, the tea of China, and the unnumbered products which commerce knows are directly or indirectly the product of the earth, and most of these the direct product of the labor of man.

Without agriculture civilization is impossible. The Greenlanders are christianized but not civilized, and never can be where they live. They have mines of valuable minerals; their seas abound in fish and seals and whales, all exhaustless sources of wealth, but the barren mountains and the eternal glaciers forbid the cultivation of the earth. And the humanizing influence of luxuriant crops and of labor on the soil is wanting. It is a want for which nothing can compensate. It is not in the icy North alone that this truth is illustrated. Even mines of gold so rich as to draw men from the cultivation of the soil, have proved a curse in every place. They will, in the end, not only tend to vice and degradation, but to poverty. It is only the riches of the soil that give real strength and resource to any people. What grows is something real—no mere representative of value, like printed paper, yellow dust or glittering stones. It is food and raiment and shelter, and these are the only real values. It was not our money that carried us through the life-struggle of the last four years. We were not a rich people in surplus money capital, which has always been reckoned the sinews of war. This was understood abroad. It was the vaunt of the English papers that we had not money enough to carry on the war for two months, and that they would not lend us a shilling. They knew the necessity of money to the English people who must import their living, but they knew nothing of the resources and power of a people with such a boundless and exhaustless soil as we possess. It was the boast of the old Roman general that he could raise an army by stamping his foot upon the earth. Americans stamped their feet upon the soil, and not only raised armies such as Rome never saw, but clothed and fed them, and amid the very din of arms, sent millions of bushels across the water to feed hungry Englishmen—whole ship-loads even as a gift. Agriculture has proved our profit in time of peace, our defence and support in time of war. It has given us strength to battle for freedom, and it has saved us from the want and suffering so incident to war. It has certainly given us dignity as a nation. While our soil gave us food and clothing for our armies, we were not compelled to become suppliants to any foreign power.

Another reason for the dignity of agriculture is that it gives an independent business to each man. The merchant is dependent upon others for customers, the mechanic for employment, and in the great mass of manufacturing establishments, large bodies of men are trained to one special kind of labor, all under the direction of some master mind. They know nothing of controlling a distinct business. They simply do their appointed work, and where the division of labor is carried to a great extent, the range of labor is very restricted. One man may spend his life drilling the eyes of needles, another polishing combs. In the great steel pen manufactory of Gillott, in Birmingham, England, the work of manufacturing is divided into twenty-four parts. There stand hundreds of men and women, working year in and year out, on the twenty-fourth part of a steel pen. Probably not one of the number could make the whole of a steel pen.

The varied duties of a farm are in strong contrast to this. Farming is a whole business,—it requires thought and forethought,—it requires constant observation and experiment. The duties of every day call for varied thought and action. No man in this world can be entirely independent of his fellow-men, and the wants of civilized life make men more dependent upon each other. But of all men, the farmer is most independent. He can live on his own products. He is his own master—his business is distinct. He conducts it not as subordinate, but as principal. Success or failure are his and not his employers. This is of prime importance to the true dignity of man. And these are among the grand elements of the dignity of agriculture—its independent life, and its making every man his own master and the controller of a distinct business.

Notwithstanding all these sources of dignity, it is painfully apparent that farming does not hold the high rank with us that it ought to hold, and by no means the comparative rank that it held with the ancients. While we praise farming, we find our farmers trying to make traders and doctors and lawyers of their sons. If they send their sons to college, they seldom think of taking them back upon the farm. In fact, a young man who should have the good sense to go from college to the farm, would probably be regarded by the neighborhood as a failure, and the expense of his education as so much money thrown away.

A part of this desire on the part of farmers to put their sons in the professions, arises, undoubtedly, from that very common mistake of mankind in thinking the employment of others more pleasant and profitable than their own. Fortunately, the merchant and professional man often send their sons back to the farm. When the Agricultural College is established I shall be surprised if we do not find among its pupils, one-half, at least, who are not the sons of farmers. Thus the generations return to the cultivation of the soil, and, like the fabled giant of old, that gained strength every time he touched the earth, so that he could only be conquered by being lifted from the ground, the race gains vigor by this regular return to agricultural life. Still the question comes back, why so much difference between the farmer's work with us and with the ancients. The answer is plain to one who knows their history. Agriculture with them came nearer the learned professions than it ever has with us. Virgil wrote a work on farming, that cost him seven years' labor—one of the most finished productions in the world. And other great men wrote on the same subject. Farming received more attention than with us, the learned professions less, so that agriculture ranked high as a liberal pursuit. The greatest warriors, statesmen and poets, found in it the most elevating and delightful employment.

A celebrated painter was once asked what he mixed his colors with to render them so perfect. His answer was, "*Brains.*" Any pursuit will have dignity just in proportion to the brains required to carry it on. This is a law which no man can reverse. And in the abundance of our land and the richness of our soil in the West, and our means of buying produce in the East, agriculture has been too easy in this country to require thought. Corn could be raised by one who never had a dozen thoughts in all his life. But every day there is an increasing demand that soils shall be mixed with brains. Whenever we can infuse such a love of investigation into the young farmers, or when necessity drives them to think as much and as deeply of their farming as the doctor does of his patient, or the lawyer of his case, we shall have farming ranking with those professions in dignity, and never till then. I almost welcome the destroying agencies of insects, mildew, drought and blight. They make more thought needed, and thus they elevate and dignify the pursuit of agriculture.

And this introduces some of the subjects that press themselves upon the farmer for study, that he may reap abundant harvests, and raise his employment to that rank where it by its very nature belongs.

Whence came this soil which he cultivates? It is simply pounded stone, a mere sprinkling scattered upon solid rocks; but still enough to give beauty and softness of outline to our globe, and furnish a yielding bed, into which the tall tree can thrust its roots, the fine fibres of the grass can weave their matted webs, and the soft, succulent beet can bury itself. Not only is it a soft bed of powdered stone, into which all these plants can plunge their roots, but through this the waters can sink into the earth, when they fall in great abundance; through this again they can rise, by capillary attraction, for the constant supply of the plant. From this very powder, too, comes that portion of the food of plants that forms the ashes, without which they cannot grow. What a wonderful provision is this! Our earth might have been left a solid rock, or in broken blocks, like the Titanic quarries of Mount Washington. New England might then have been covered with lichens, that cling to rocks, and feed upon air, and perhaps with some higher though humble vegetation. But for the rich fields of our highland towns, and the fertile Valley of the Connecticut, some mighty machinery must be brought into play. That great geologic agent, water, was called into action. It was piled up in frozen masses on our northern hills, until they and their valleys were covered by a glacier, by the side of which the glaciers of Switzerland or Greenland are pigmies. This enormous mass, moving towards the south, not only ground the rocks to powder, to form the soil, but so mingled their materials that the uniformity of composition was a wonder to chemists long before they understood the vast quartz crusher and sifter which nature had set in motion to prepare the globe for man. Every farmer's field presents rich geologic problems. Every worn pebble that his plough brings to light, every layer of sand, every bed of clay, has a history written in it that tells of past changes. Do you say such knowledge will not grow more corn. I doubt that. But at least it opens a field for thought and study; it brings the brain into action with the hand, and when that is done the dignity of labor will vindicate itself.

It is not the soil alone that demands the farmer's study, but every plant that it produces, and every destroyer that preys upon his harvest. To obtain a crop is a warfare among all these enemies, but it is warfare of study and thought more than of manual labor. If to these inducements to intellectual culture we add those by which the farmers' crops cannot only be protected but increased, we have love of learning and love of property combined to call out the mental activity. Among these means of profit, while it is most fascinating as a study, is agricultural chemistry. Not that we would for a moment countenance the quackery that has abounded in connection with this branch of science. We do not advise farmers to send a snuff-box full of soil, and give five dollars, to know what their fields will produce, as spiritualist doctors tell diseases from a lock of hair; but we wish them to understand so much of this science that they will know when they are robbing their fields of their richness. We wish them to understand the changes going on around them, in the soil and above them, and understand the means by which they can call down riches from the air, and change the poisons, that generate disease, to golden corn and delicious fruits. The poisons of our summer months, that threaten cholera, ought, under the skilful manipulations of science, to be turned into new channels. They ought to blossom in the rose, and appear transformed into the rich fruits of the field and orchard. If, now, we set before us the varied fields of investigation, where mental must be joined with manual labor, in what profession will you find more interesting, more delightful, more useful, and more constant subjects for thought and study? In this, as in all other pursuits where science is joined with practical labor, new sources of pleasure and profit are constantly opening. It is to be sincerely hoped that one result of scientific, intelligent farming, will be to stop the waste by which our lands are drained of their riches. It is not enough for us that our crops must cross the ocean, carrying in every shipload precious substances taken from the soil, never to be returned, but from the sewers of our towns and cities, from every manufacturing establishment along our streams, flow out constantly, into the rivers and on to the ocean, the strength and productiveness of our land. Is this waste never to cease, and is not this material yet to be poured back upon the land from which it was taken? If it is not, then when we look out upon the water, it is not richly freighted ships that we are to think of as buried beneath its waves, but it is the strength and riches of the land, which commerce brings to the thousand tributaries of the ocean, and the thoughtlessness or wastefulness of man pours into them.

There is in agriculture another source of mental cultivation, referred to in the beginning of this address, to which I again invite your special attention. It is the cultivation of the beautiful. Nothing is plainer than that *beauty* was as distinctly provided for in creation as utility, if it is not indeed itself one of the highest utilities. And nothing is more common than for mere beauty to be despised by a certain class of farmers, who pride themselves on their plain common sense. Their value of a fine tree is the number of feet of wood it will produce. They build houses like sugar boxes, with a hole in the middle. They select, perhaps, the very poorest place upon their whole farm for its location—the barn and out-houses shut off the best views—old carts, broken sleds, half chopped logs, lumber the yard, while posts, broken boards and piles of stones and rubbish adorn their road fences. All this they endure for a lifetime, and think there is no help for it, when the same money would give them tasteful dwellings, and two days' work a year would clear their grounds of every kind of rubbish. We can hardly expect such a man to stop to admire the beautiful flowers with which nature enamels the earth, and every rod given up to roses and tulips he considers so much taken from honest potatoes and corn! Now it is in vain for me to read such a man a lesson. We must turn him over to nature, and he will soon find either that he or she has made a great mistake. She spreads beauty everywhere, as though it was a prime element to be made prominent in all her works. Let him trace the wavy outline of all the leaves—their varied but beautiful patterns—and then mark their tints, as from emerald green, they flash into the blaze of autumn glory, the perfect pattern and balanced colors of the flowers. Let him admire the pictured lichens, with which nature smooths the rugged rocks and adorns the old posts and rails. Where could we stop, if we enumerated one of a hundred of the objects, where beauty seems to be the chief end of creation? What flashing gems; what gay plumage on the birds; what wealth of beauty in the field and forest! Do you doubt whether this was done for man's instruction? Nature is his school-mistress. And if there is one lesson which she has so arranged that he must read it every day and in every place, it is, that beauty is not only a source of delight, but that it is man's duty to increase beauty. It is remarkable how beauty and utility are joined together. The most beautiful horse, the most beautiful stock of any kind, is generally the best. The more beautiful fruits are generally rich in flavor. This is not always so, but it is so common that the beautiful stock and beautiful fruit first attract attention, and every one will believe them best till the contrary is proved. We can go farther still, and show that nature has provided for the increase of beauty in some plants at the expense of every other good. If we cultivate the apple, or corn, or potato, we get better apples and corn, because they were made for man to eat. But if we cultivate the rose, the violet or the dahlia, we simply get more beautiful flowers, because they were made, not to be eaten, but to give delight by their beauty. There is in every plant the creative idea, or the leading idea of its creation, which proper cultivation will always develop. And full as many plants develop in the line of beauty as in the line of fruit, and no power of man can change their line of development. He may cause the rose or the dahlia to form new varieties, almost without limit, and they may become so double as to lose all power of producing seed, but no power of his can cause the rose or the dahlia to produce delicious fruit instead of double flowers. They and their sister flowers were made for beauty. Man can work with nature and increase that beauty, but he might as well cause the rivers to flow back to the mountains as to defeat nature's plan, and change her choicest flowers to useful fruits. She holds her ground and declares to you, that while she adorns all nature even in the production of fruit, she will have you to understand that she seeks beauty for its own sake, and if man would be truly cultivated and enjoy the earth, he must seek it too—seek it where it comes without his bidding, and seek it too by care and labor, as he does the precious fruits of the earth.

We have, then, in agriculture a pursuit which is educational in its nature, and which demands education for its successful prosecution. There is in our country a reason why scientific agriculture has been undervalued. We have untold acres of virgin soil. When one farm has been impoverished, farther west lies another. And the journey to it costs less than to bring back fertility to the old. All of our skill in agriculture has been exhausted in finding new ways of putting in and gathering crops. We invent planting machines and astonish the world with our reapers, and thus become powerful to steal away the riches of the soil. We can no more make unlimited drafts upon the soil than we can upon our bank account. Whole sand fields in Virginia and other portions of our country show where the account has been overdrawn. Shall we go on sweeping over our fair land, converting it to a barren waste, or shall we learn to receive from the earth only that we may pay her well in return? As land becomes scarce, the problem will be pressed upon us, how to make New England soil most productive. And to aid in solving this problem, we have now established agricultural colleges. We look to them to give dignity to the pursuit by giving us a class of highly educated farmers; by reducing the scattered facts of agriculture to a science; by so presenting the subject, that it shall be seen that farming demands constant and most intelligent thought. We expect also that here will be tried those experiments which cost too much for common farmers, but which are needed for the greatest success and progress in the pursuit. We expect that Massachusetts will become richer in its soil; that the day has gone by for robbing the earth, the hills and valleys of the old Bay State, and then deserting her for the West. We think the day is coming when she will understand her own interest, and foster by every means in her power this great interest, now so much neglected. In that college we shall find the sons of many professional men, who have learned the blessings of a farmer's life, either in contrast with their own, or by the remembrance of early experience. Bread will always be earned by the sweat of the face, but if agriculture can be brought to that standard where it ought ever to be found—where it calls to its aid all the natural sciences—it will certainly equal the learned professions as a field for intellectual enjoyment. When that day comes, those will be doctors and lawyers who cannot buy farms. But while farmers deride science and learning, let them not complain if their business takes a low rank. As they cannot cause the clouds to drop down the dew, nor the snows to melt from the hills, so they can never raise farming to the level of other professions until it requires the same study and the same thought which they demand. It is the brain and not the hand that gives rank to man—or rather the brain and hand combined. *It is the brain guiding the hand that gives rank to any labor which man performs.*

The lecture was listened to with great interest, and a unanimous vote of thanks was tendered to Professor Chadbourne.

Adjourned till nine o'clock to-morrow morning.

WEDNESDAY MORNING, DECEMBER 13.

The meeting was called to order at the hour assigned, by Hon. E. W. Bull, the President.

Hon. LEVI STOCKBRIDGE, of Hadley, was chosen chairman.

REMARKS OF MR. STOCKBRIDGE.

On taking the chair, Mr. Stockbridge said:

Gentlemen of the Board,—I hardly feel like assuming the position of chairman with any idea of leading off with the discussion of this morning.

I am told that the business which will come up for discussion is "DISEASES OF ANIMALS." That, then, is the subject now before you. It is expected that gentlemen present will participate in this discussion freely and fully. No individual has been assigned to lead in this matter. The meeting is open for the discussion of this subject, and I hope we shall have such a discussion as may be of advantage, by leading to such results as are important to us all.

Mr. FLINT, Secretary of the Board, stated that the committee on meetings being absent, he would inform the Board that the committee had invited Dr. Joseph H. Stickney, Veterinary Surgeon, of Boston, to be present, and give his views on the subject for the morning's discussion, and he hoped that although Dr. S.

had not yet arrived, he would be present at a later stage in the meeting.

This question, Mr. Chairman, is very indefinite, and, as it is worded, embraces the whole subject, and opens it to inquiries or statements on the part of practical farmers.

I do not profess to know much about it, but for the sake of introducing the subject I will make a few remarks, which may lead to further discussion.

The most important thing, at the present time, for farmers, all over the country, to consider, is the possible introduction of the cattle plague from Europe. Probably the facts with regard to that disease are pretty well known, particularly to those who read the agricultural papers, and I can offer nothing new that has not appeared in some of those papers. The cattle plague in England is quite different from the pleuro-pneumonia. In the first place, the period of incubation, or the time from the first exposure to the breaking out of the disease, is entirely different. The period with the cattle plague is only from eight to twelve days, while that of the pleuro-pneumonia is irregular, but usually about forty or fifty days.

Again, the symptoms are very different. The cattle plague is an abdominal disease, while the pleuro-pneumonia is a lung disease. The fatality, also, is very different. That of the cattle plague is eighty or ninety per cent., and often even greater, while that of the pleuro-pneumonia is only twenty-five or thirty per cent. Of course, the plague is more dangerous and more to be apprehended. That both diseases are contagious I think is well settled, both by our experience and that of Western Europe. I think, also, that neither can arise spontaneously or indigenously, either here or there. That is well established.

When the cattle plague broke out in England, about the last of June or the first of July, the French government sent one of their first veterinary surgeons to England and another to Germany, to make investigations in regard to the facts of the introduction of the disease into those countries. After some time, the gentleman who went to England ascertained that that disease had been introduced from the Gulf of Finland, and that they lost some two or three thousand in a week in the month of July. Many facts were also obtained in Germany, so that the French government acted with great strictness, and absolutely forbade the introduction of any cattle from any place where there was the least possibility of getting the disease. They also forbade the introduction of hides, which might introduce the disease, or any other articles which might do it. So they have prevented the disease from reaching France, so as to spread to any extent, though they have some of it in Belgium.

Congress has passed an Act to prevent the introduction of the disease into this country, though I do not think it improbable that we shall have it, sooner or later.

After some time the English government established a commission, composed of the Earl of Spencer, Dr. Lyon Playfair, Dr. Bence Jones, and other scientific and practical gentlemen. They made a report on the 31st of October, a little more than a month after their appointment, having summoned a great number of witnesses, cattle-dealers, &c., and they say in their report that the disease is the genuine cattle plague of Europe, from the steppes of Russia, and what the Germans call the *rinderpest.* They think there is no doubt that it was introduced by imported cattle. England imports about a thousand head of cattle every day, principally into the London market. These cattle are picked up on the continent, some coming through Hamburg, some from Russia and other points on the Black and Baltic Seas.

That commission, after investigating the matter, considered the disease as incurable as it is contagious, and that it was even carried in the clothes of people who took care of the cattle. So sheep, that had been with a herd that had the plague, could carry the plague to other herds of neat cattle. It is not established certainly that the pleuro-pneumonia can be carried in that way, but it is probable.

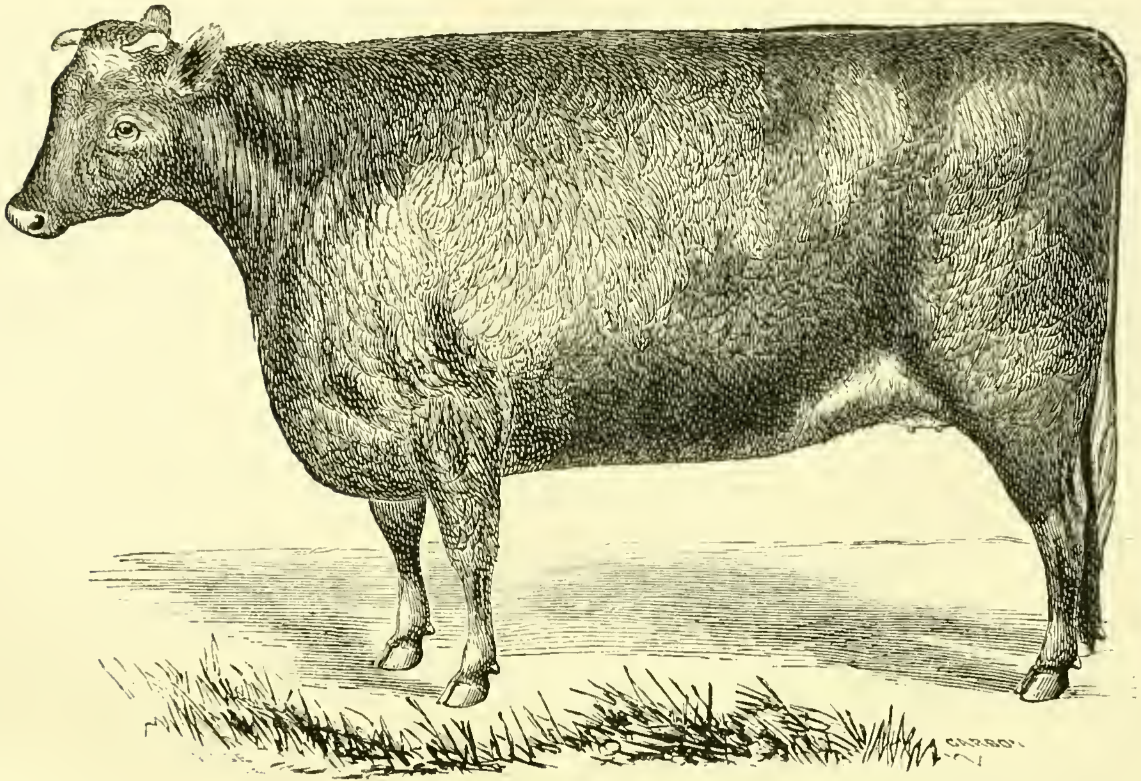
The commission, as I have said, came to the conclusion that the cattle plague is absolutely incurable, no remedies having had any effect. They could only recommend its prevention, therefore. They went so far as to recommend to the government to prohibit, absolutely, the moving of cattle from one market to another. You can readily judge what an effect that would have on the cattle interest in that country. Though the government has not yet resorted to that, they may have to do it, or endure a dozen or fifteen years of the cattle plague. I hope such a course will be taken as to prevent the introduction of the disease here, and that the eyes of farmers will be open to the immense importance of trying to prevent it.

Mr. CAPEN, of Dorchester, inquired more particularly as to the history of the disease, and the manner in which the cattle plague was introduced into England.

Mr. FLINT.—This disease comes from the steppes of Russia, and from the shelterless plains of Southern Siberia, stretching away for hundreds of miles, under the blaze of a burning sun, baking and panting in the heat. Like a monstrous spectre it stalks forth to breathe its fatal blast upon the horned cattle of the West. On those boundless wastes the grass withers under the fierce sky, the water-courses dry up, the ground becomes parched and gaping with thirst, and the grasses that are left are coarse, innutritious and tasteless. The cattle perish in vast numbers, or, if they have vitality enough to withstand the horrors of the drought, they may linger through the winter, nursing the germs of disease to communicate them to still hardier ones that have survived the drought and the famine.

Let us glance for a moment at its periodical visitations. We shall find that it has almost invariably spread from the banks of the Don and the Volga towards the Danube, and extended over the countries of the West. As early as 817 the cattle of Hungary were swept off in vast numbers, and it crossed the Drave and travelled as far as the Atlantic coast. In 1223 Europe was again devastated by a disease supposed to be this same contagious typhus, generated at the foot of the Carpathians, and sweeping the vast herds of Hungary almost from the face of the earth.

Still more recently, in 1625, the plague broke away from its bounds, invaded Northern Italy, swept up along the banks of the Po, was introduced by the cattle dealers into the refined city of Padua, and so over the whole of the Venetian territory. But in 1709 the losses were still more immense. Like the march of death, it went from Tartary through Muscovy, passed the confines of Bessarabia, Croatia and Dalmatia, and so into Northern Italy and France. It went from Hungary to Southern Germany and Switzerland, and from Poland north and south into Silesia. Through the States of the Pope it went to the Neapolitan domains, where the mortality, in a few weeks, proved to be double that of the north, 70,000 head of cattle being destroyed. The plague then invaded the Netherlands, where it



Shorthorn Heifer—"EUGENIE." Recently purchased by CARLOS PIERCE, Esq., from the herd of H. G. White South Framingham, Mass.

swept off 200,000 head of cattle in a few months. Holstein, Finland and Denmark also suffered terribly. In 1713 it got across the Channel into England, and was as destructive as in other countries.

It is estimated that about a million and a half of cattle fell victims during this visitation, which lasted from 1709 to 1713. Again, in 1740, Hungary was visited, and the pestilence crossed its bounds and moved over the whole of Germany, into Switzerland, Piedmont, Franche-Conté, and northward into Denmark, Sweden and Holland. After lingering five years on its passage over the Continent, it again crossed into England, and for more than twelve years laid waste the herds of Great Britain. In the third year of its visit the government had vigorously taken the disease in hand. No less than 80,000 head were slaughtered, and the number that died was no doubt double that. In the fourth year cattle were destroyed at the rate of 7,000 a month. In 1747 more than 40,000 head died of the plague in Nottinghamshire and Leicestershire alone, and at least 30,000 head in Cheshire died in six months. From 1713 to 1796 no less than ten million head of cattle perished in Europe.

During the long period of war which followed the French Revolution, the plague broke out again. It followed Napoleon into Italy in 1793-4-5, and in those three years Piedmont alone lost from three to four million head of cattle. It spread through the Danubian Principalities into the south of Germany, where it continued its awful devastation uninterruptedly from 1796 to 1801. But while the operations of war were confined to the west, the pest withdrew again to the Russian steppes till 1806, when the Cossacks of the Don mustered along the Vistula, when it again spread from the interminable wastes to the cultivated regions of Lithuania, Prussia, and Silesia. It followed Napoleon on his retreat after the battle of Eylau, and cut off the stock of those countries for two years in succession. And so in 1813 and 1814, when the forces under Schwartzenburg invaded France, Switzerland and the Rhine Provinces, through which they passed, suffered immensely from this curse, and they had to resort to the most stringent sanitary measures, slaughtering the diseased and isolating the healthy, till they at last put a stop to it.

The Crimean armies had to encounter the plague again, for the cattle upon the steppes were dying in myriads, but it did not then spread over the west for the reason that no large English or French armies moved by land with their immense trains of supplies.

The disease, however, got into the French camps, and afterwards into the English camps. The veterinary surgeons endeavored to prevent it; but they had to use more or less of the meat which was thus infected. It is a general fact that whenever large armies have moved over Europe that disease has followed. After the disease had been raging in England for some time last summer, the officials of the Russian Government endeavored to make it appear that it had not existed in Russia since 1859. But the exportation of cattle from Russia is immense, and of course it was desirable to make it appear that it could not have come from Russia to England. But you have seen reports from our Minister at St. Petersburg and our Consul at Warsaw; and we know that last year, 1864, more than one hundred and sixty-four thousand head of cattle were attacked with this disease, in Russia alone, of which one hundred and four thousand died. So that there can be no question that the disease has existed in Russia, more or less, for many years, and is liable to break out there at any time, because it is indigenous there, and in some parts of Asia, which is not the case in Western Europe, or in this country.

There is one feature of the disease in which, probably, it has the advantage of the pleuro-pneumonia, and that is, in the more complete recovery of some portion of the animals attacked. There is no reason to suppose an animal that did recover would not be as sound as ever. Not so with one suffering a severe attack of pleuro-pneumonia. The lung tissue having once been destroyed to a greater or less extent, no effort of nature can restore it so that the animal can be regarded as sound. It may so far recover as to take on flesh and fat, but no farmer would ever want to own such an animal, much less to breed from it.

In the cattle plague, in other words, no vital organs are permanently destroyed so but that, in case the animal survived, it might not be considered as sound.

Leaving this particular disease, I wish to state that there was a wart case brought to my knowledge the other day, and I should like to know how it can be cured. A man has a heifer almost covered with warts. If any one has had experience in curing them I shall like to know how it can be done.

Mr. STEDMAN, being asked to give his views on that subject, said: I should not be able to give any light on that point. I keep a bottle of oil of spike-root which I use. But I have never had but little experience in diseases of cattle. If my cattle have warts I let them alone and they come off themselves. I think our cows are more liable to diseases than other stock, some arising from difficulties connected with parturition. I have not been troubled, however, with such diseases as have prevailed in some places, and as they have had in the State of New York, where they lose their calves by shrinking or abortion. I have rarely had anything of the kind, and when I do, and suspect a repetition of it, I slaughter the animal.

With regard to the cattle plague, I was very glad to hear the remarks of the Secretary. I saw an article in the "New York Independent," by Hon. Amasa Walker, in which he seemed to speak of the cattle plague as identical with the pleuro-pneumonia. I thought he was mistaken.

Mr. FLINT.—It was certainly a mistake. There is scarcely any resemblance between the diseases.

Mr. WHITING GATES, of Leominster.—When warts come on young stock, they will generally go off the third year, as I have observed; and I have heard others remark the same thing. I know of a case where a man bought a valuable cow at a low price, because she had warts. He cured her by washing the warts in copperas water, dissolved in an iron kettle. The cow had several large warts on the lower part of the abdomen.

Mr. C. O. PERKINS, of Becket.—I have had some experience in curing warts. Sometimes they are of a kind called blood-warts, and at others they are more of a scurvy nature. I have seen warts as large as a two-quart measure. There are three or four ways in which I get rid of them. One is to cord them tightly with a small string, so as to stop the circulation of the blood. Sometimes, when they have only a small attachment to the body, I pull them off. They do not bleed enough to do any harm. I have never seen an animal that had so many as the one described by the Secretary. Fish oil will sometimes destroy them; copperas water will do it also. The fish oil seems to stop the connection with the atmosphere, so that they dry up.

Warts should not be confounded with "the mange." That sometimes kills animals. It can be cured with copperas water and sulphur. The mange is probably caused by a small insect. The cattle itch, and are very uneasy. Sometimes animals die with it.

We have a disease called "the black leg," or murrain among us, which is fatal unless it is treated early. I wish to know the opinion of gentlemen as to the cause. Young cattle, especially when very thrifty, are liable to be attacked with it in the fall. Some people lose a great many of their yearlings. They are generally taken in one fore-leg first, and by rubbing the hand upon the skin a crackling can be heard, and when the animal dies, the flesh is black and putrid. The animal will swell about the fore shoulders before it dies. I shall like to know the cause and the preventative.

Mr. Adams, of Fitchburg.—We sometimes call "the mange" "the barn itch." An application of sulphur and lard is a good remedy; a pretty sure cure I think.

Mr. Gates.—My grandfather used as a remedy for "the barn itch," bacon lard. I have tried it, when one application has removed the whole. Whether it is the kreosote derived from the smoking of the bacon that makes it better, or not, I cannot say. If it is not removed it will go over the whole animal, as a general thing.

Mr. Smith, of Middlefield.—I have not had much trouble with diseases of cattle. I have rarely lost any. The "black leg" is in our section some. I have known people who dared not to feed their calves high for fear of that disease.

I have sometimes had some experience with swelled or caked bag. For that I generally milk all I can from the cow, and then let the calf go to work. If he is hungry he will bunt and get the milk out. I think the best way is to get all the milk out. If it is not got out the inflammation increases. I never have had a case fail, for I always begin with it early.

For garget, or bloody milk, I use saltpetre. I have also used garget-root, or poke-root as it is called. But in very bad cases I do not know as there is any cure. I give about a table-spoon full of saltpetre in a potato. I have little trouble in getting them to swallow it in that way.

When the withers are cast, as it is called, I have often had cases to put back. It is a hard and not a pleasant business; but perseverance will often save the animal. I have had cases very severe indeed; in one instance, where the cow had lain in the stable all night in that situation, and had chafed and torn it badly. I washed it in milk and water, and succeeded in getting it back. It seems painful to the cow to get it back. I have sometimes put a small chain around the small of the back, and put a twister in, and then have a man stand and hold it, not tight enough to hurt, but so that a little twist will press on the back, and the cow will hollow in the back. She cannot curve her back up with this twister on her. In twenty-four hours I have cured such cases, almost always. I generally take a stich or two to prevent its coming back.

Mr. Barnard, of Worcester.—Generally, when I have any of my cows troubled with caked bag, I milk all I can. My practice used to be, to wash the bag in cold water; but that took a number of days before the bag would become natural. For the last case I had I used turkey oil. It was a young cow, and her bag was so hard it was almost impossible to milk her; but by using turkey oil she was cured in three days. I have had a case where, by putting it on in the morning the cow was cured by night. This method will certainly cause the cow less pain than the bunting.

Mr. Smith responded that he thought some other application would be better than bunting if the case was a severe one; but he endeavored to begin so early as to prevent their becoming very bad.

Mr. Barnard.—I think when a cow has her bag filled she had better be milked some, for two or three days before calving. I once had a cow that I milked two months and nineteen days before she had a calf. I found her in the pasture with a very full bag, though she did not have any appearance of having a calf immediately. But I got her home and milked her; but the next morning her bag was full again, and then she was milked regularly from the first of June to the nineteenth of August, giving ten quarts a day.

To an inquiry whether the calf was not diminished in strength, Mr. Barnard said it was a small one.

Mr. SMITH, of Middlefield.—There are two kinds of caked bag; one which is on the surface, and comes on young heifers more than old cows. It does not reach the udder. It is not very sore, though the teats are much swollen. But the other kind, which is the inflammation of the milk glands, I think can hardly come on before calving. This produces great heat, while the other is rather cold.

Mr. GATES, of Leominster.—I have applied molasses for a caked bag, and rubbed it in thoroughly. Two or three applications will generally remove the difficulty.

Prof. CHADBOURNE—One gentleman speaks of applying turkey oil; and another, molasses. Perhaps all farmers cannot have turkey oil. Would that gentleman suppose there is any quality in turkey oil, which is not found in other soft, animal oils?

Mr. BARNARD.—I do not know that the turkey oil is better than any other.

Prof. CHADBOURNE.—I find there is a general impression in communities that goose oil has peculiar qualities, and turtle oil, and hens' grease; and that skunks' oil has remarkable properties. They all have the same soft qualities generally. If we can get hold of some general principle so that the farmer can have something at hand always, which will operate well, it will be desirable to do so.

I was pleased with the remedy of bacon fat in connection with the suggestion that perhaps the kreosote helped. It occurred to me at once that kreosote is a very valuable remedy in all cutaneous diseases. Thus we may have a very general remedy, by taking a few drops of kreosote and mixing it with fat.

Mr. BULL, of Harvard.—Our friend over the way, (Mr. Barnard,) referred to the use of cold water, and others have referred to softer remedies. I had the best heifer I ever raised come home from the pasture and drop her calf at the usual time. She had a bag unusually swollen, heated and red, perhaps the result of the good pasture. I applied cold water—everybody applied cold water in such cases—and put it on thoroughly. I suggested to a friend that I was likely to lose that splendid beast. Said he, "What are you doing for her?" My friend said I could not do worse than to use cold water. Said he, "Have you a wife?" "Yes." "When your wife is confined do you put cold water upon her?" "No." He then said, "Reverse it; put the hottest water you can bear your hand in and that creature will come right." It was too late for that year. I lost the use of one-quarter of the bag one year, and there was a hard substance continued in that quarter of the bag the whole year. This year, when she came in, I applied water as hot as I could bear my hand in, and she has given more milk from that teat since August than from either of the others, and it is now making up for last year. On inquiry, I found I had a friend in Framingham who used the same remedy. I often lost the use of an animal, or one teat, when I used cold water; but since I have used hot water I have not lost one.

Mr. Bela J. Stone, of Sturbridge.—I have had considerable experience with caked bag within the last fifteen years. I have used cold water a good deal. I had the typhoid fever three years ago, and I had cloths as hot as I could bear them applied to my bowels, and since that time I have applied hot water to swelled bag. In one case I told my man to apply hot water and soap-suds, and the second application he said he could see the swelling come down. In twenty-four hours it was almost entirely removed. The cow had been troubled with garget somewhat. I want nothing better than hot water.

Mr. Bull.—There is no mistake about it, for a simple swelled bag. I should not be afraid to warrant that if applied to a heifer she would come out right, if applied early. The garget I know nothing about.

Mr. Stone.—I do not assert that is a remedy for the garget.

Mr. H. Garfield, of Lee.—I am exceedingly interested in this discussion upon the subject of the inflammation of cows' udders. I have never had any great difficulty in reducing this inflammation in my own cows, and I have been called to help my neighbors in such cases. My remedy has been warm water and soap-suds, rubbing with a sponge; and after the washing I wipe all the water off with a dry cloth, and then apply lard as the most convenient oily substance. I seldom have to apply this remedy more than two or three times to produce a cure. I give the udder a thorough manipulating with the soap-suds, and then cover with lard.

Mr. Tidd.—I am very glad to hear this subject discussed in this manner. It is a difficulty that every one who has a dairy has suffered from more or less. I have had a good deal of painful experience in this matter. I have tried every remedy that has been mentioned here. Sometimes I have succeeded, but I have often failed, in using many of them. I have lost many valuable cows in this way. There are different kinds of inflamed bag. Sometimes it may be caused by too high keeping, or something that causes a secretion of milk to a great extent. It has been suggested that milking the cow previous to her coming in is a remedy. Some years since I had a young cow that came in late in the season. I found she was having a very full bag, and being apprehensive of difficulty I commenced milking her once a day. I found that would not be sufficient, and milked her twice a day; and if I recollect right I got nearly a pailful twice a day. I milked her ten days' or a fortnight before she dropped her calf. Her bag milked down soft previous to her calving, but after that it began to cake. I used every remedy mentioned here, except hot soap-suds. Notwithstanding, the inflammation increased, till I virtually lost the use of the cow.

I have no doubt there is a benefit sometimes in milking before the calf is dropped; but when we find a cow at that time secreting milk too rapidly, it will be well to put her on a limited diet, not feeding very high. I knew one valuable cow, bought at Mr. Peters' sale, that was in high condition when purchased. She came in the first of June and was turned into good pasture and not milked at all, but remained in the pasture with her calf. After a time she was milked, and then a fever commenced. They got her into the stable and sent for a veterinary surgeon, who applied his best remedies. But on the third or fourth day the cow died. The calf was raised.

There seems to be a difference between inflamed bag and garget. The bag sometimes becomes hard a considerable time after calving, though there is no appearance of any trouble at that time. Sometimes, perhaps, the first indication of any difficulty will be a little obstruction in one teat, so that the milk is extracted with great difficulty. This increases, and soon that quarter of the bag will begin to harden. In some cases warm water will prove successful; in others nothing succeeds. A few years' since I had a very valuable young cow—her third calf, I think. When she came in everything was right. The next morning I found her coat standing, and she was apparently diseased, but there was no indication of a swelled udder. I immediately sent for Dr. Penniman. The inflammation went on, and the second day, I think, one-quarter of the bag began to harden. Finally, one-quarter of the bag ulcerated and dropped out, nearly as large as my hand; so the inflammation went on, till I lost all but one-quarter.

I have tried the seton in the breast, but without effecting a cure. The quarter of the bag forward began to harden, and I applied poultices, which seemed to relieve her. Previous to that application she seemed to be in pain. I have known hot applications made to a thoroughbred cow. They saved the bag, but did not cure her. She finally lost that quarter of the bag. Whether the difficulty in these cases arose from the applications being made in different stages of the disease, or whether the diseases were different, I cannot tell. I have always endeavored to do what I could immediately.

I have given saltpetre for the garget, either with the feed or by dissolving and pouring it down. Very many in our neighborhood have suffered more or less from one or the other of these diseases. I think it possible it may be owing to the breed, or to the high feeding. The effort has been made, of late years, to increase the milking qualities of cows, and probably this may tend to increase the inflammation of the udder. The cow that never gives more than half a pailful of milk is never exposed to have an inflamed bag; but it is the most valuable cows—the higher grade of cows—that are afflicted with this disease.

Warts are removed very easily, when they come on heifers at two or three years of age. Grease, of almost any kind, is good; or they can be taken off without difficulty sometimes.

The PRESIDENT.—Will Mr. Tidd give his opinion as to what is the predisposing cause of the garget?

Mr. TIDD.—I wish I knew. I wish I had known many years ago; because if we knew the cause, we might be able to administer the remedy. It seems to come on from a large secretion of milk. Even when the milk was kept down, by milking previous to calving, the inflammation would sometimes come on afterwards, and where the obstruction was in one teat only at first. I do not know what it is. There seems a little obstruction at first, and soon after the inflammation shows itself. I think that a restricted diet is the best preventive for great milkers. I told a neighbor of mine, who had a very valuable Shorthorn cow, that I would take her up and keep her on short allowance before calving. He did so, and she did well. Perhaps she would if he had not done it.

Mr. HOMER, of Brimfield.—I have been sufficiently instructed upon diseases of the bag; but there are one or two other diseases that I think we should consider. One is the foot-ail, and another, which has gone through my lot of cows, is the kine-pox. My cows have had it more than a year. It is as contagious as the smallpox itself among cows. A man who worked for me, and milked the cows, claimed that he took the kine-pox and suffered from it, by milking the cows. There first appears a little spot on the teat, which spreads, and finally hardens into a scab on the surface. I have no hesitation in saying that the matter from it will produce the genuine kine-pox.

Dr. MARTIN, of Worcester, being desired to express his views, said:—I wish to throw a little light, if possible, on the subject of swelled bag. I think gentlemen have all aimed at the right treatment. There is no doubt, I suppose, but that the young cow which is the best, is much the most likely to have a disease of the bag. It is the result of a variety of causes; but the cow which is going to give the most milk has the cause which is most likely to produce the disease. Pressure is the great cause; the increase of the size of the bag is another; another is the plugging of the ducts which produce the milk. All of these causes operate to produce inflammation, which is the result; then comes suppuration, and finally a sloughing off, or mortification. All these result from the same cause; but you can see how different the treatment in different stages of the disease. The cold treatment might be good in some stages. But the difficulty is, that it is applied to the surface, and does not reach the seat of the disease. If we could extend the cold down, so as to prevent the flow of blood, it would do good. If ice could be applied, as it may to a person, the cold might reach the disease and do good. But as it cannot, the warm treatment does good, by attracting the blood to the surface, away from the deep-seated inflammation, and relaxing the place where there is a plug, if there is one. In a variety of ways the warm treatment is better, especially for farmers generally, because it acts immediately.

Another thing farmers will find great benefit from, which is, swaying the bag up. The organization is much the same as in man. We almost always find it difficult to treat a swollen testacle without suspension. A strap may be made with holes in it, to draw up the bag; but too much pressure may do harm. But if you take off the weight, you take off the tendency to the flow of blood to the parts. But if you are as successful, after all, with the treatment of the bags of the cow as you wish to be, you will be more so than we have been with the women. A low diet, for a high-bred cow that is going to give an immense quantity of milk, is good. If some of the ducts become stopped, you must reduce the feed, or you will have suppuration and mortification.

I always supposed that garget and inflammation were the same thing—that one was the effect of the other. I suppose that garget is a permanent lesion of the organ itself. It is something that you cannot cure very well. There are many cases of suppuration that farmers cannot understand, because there is no outside opening. Sometimes they mistake pus for blood. Inflammation is not the first cause; there is a plugging of the ducts which precedes. But, ordinarily, if the inflammation is kept down, one after another of the plugs will go away.

The best way, is not to feed a nice cow too high before coming in, and not with very good feed, but with a kind of feed that is light and dry. Then I think the warm application the safest for farmers, because they cannot apply the cold so as to reach the disease. Then keep the bag swung up. There is a variety of oils which may produce somewhat the same effect as the warm applications. After the first stage is past the oil is better than the warm water. We use, in chronic cases, for females, belladonna and mercurial ointments, in equal parts. This has a better effect over any glandular disease than any remedy we know. The diseases are the same in cattle as in the human being. Those ointments can be obtained of the apothecaries. This remedy is not so sudden in its action as some others, but you get a better absorption of the pus. That is the same in other animals as in man.

Mr. Keith, of Grafton.—Is not the disease you have spoken of the same as what is called the milk fever?

Dr. Martin.—It is, probably.

Mr. Flint.—Would not the application of oils stop the insensible perspiration?

Dr. Martin.—It is generally understood that the oils do not enter into the pores sufficiently to prevent perspiration. The ancients applied oils liberally as a preventive of disease. We apply oil frequently. An application that we use with females is equal parts of vinegar and warm water. Anything that will retain heat well, and keep the part as hot as possible, is good. We had in the army a kind of cloth with a long nap on it, that retained the heat a long time. It acted like a poultice, exactly. That, or its substitute of some kind, would be an excellent thing to apply under the strap by which you would suspend the bag. Anything that will keep the heat in is good. And then you will fail sometimes. There is no absolute, specific remedy, that will always cure.

Mr. Tidd.—The foot-ail is a disease that all farmers suffer more or less from. I have heard of several causes that produce it; but I never heard of one that, under the circumstances, I was satisfied did not produce it. It is a very troublesome disease; but whether it is contagious or not I do not know. I have sometimes had eight or ten cases in the course of a season. Sometimes it can be cured very readily, and at others it is very difficult. One remedy is to wash very clean between the hoofs, and apply strong vitriol water. Many cases that application will cure soon. Sometimes I have used spirits of turpentine or hot tar. Farmers, not knowing what is best, are apt to resort to anything that they hear of. In one case that I had, the ancle swelled and the animal was very lame.

The kine-pox is a disease that all farmers have more or less of who have dairies, and sometimes it lessens the quantity of milk very much, and frequently it will be very serious, affecting the teats for a long time.

A Member.—Does the disease affect the same animal more than once?

Mr. Tidd.—Yes. I once supposed it did not, but I have lately had experience that it did.

Mr. Barnard, of Worcester.—Of late years I have used an application of about equal parts of spirits of turpentine and rum for foot-ail. I have never had a case last more than three days. I have had oxen and cows, so bad they could scarcely get out of the barn, cured perfectly in three days. I keep my oxen in the barn the year round. When I kept my cows treading around in the mud of the barn-yard, I had more of the disease than I do now. I have treated it successfully with spirits of turpentine and rum for twenty years.

Mr. Hadwen, of Worcester.—My treatment of garget and swelled bag is to rub the bag well with the hand when it first begins to swell. In a short time the swelling will go down. The rubbing should be continued several times a day before heifers come in, and often with old cows it may be necessary.

I use turpentine and alcohol for foot-ail, and by a little application in its early stages it can be cured immediately.

Mr. Tidd.—Another subject has been broached, of which nothing has been said. It is the abortion of cows. Dairymen in our vicinity, and in other States also, I believe, are suffering much from this cause. If any one can suggest the cause or the remedy he will confer a great benefit upon us. It seems to me to be increasing. Some dairymen lose many cows in a season, and they have not been able to discover any cause for it, or any remedy.

Mr. Thompson, of Nantucket.—Among all the suggestions for the cure of swelled bag, I have not heard that mentioned which I received from Hon. John Brooks, of Princeton, late member of this Board. I once asked him for his method of treatment, and he told me he never found anything to succeed so well as a heavy dose of salts immediately after calving. It struck me very favorably. We all know that at the time of parturition in the human family there is a great deal of excitement in the system, and much fever. If we can allay that fever before it takes any definite form it will be of advantage. The dose may be a pound or a pound and a half, according to the size of the animal. In this way the fever is reduced, and we reduce the amount of food at the same time. When I have adopted this course, and found a small amount of swelling, I have taken lard and applied it pretty hot, with manipulation. The result has been as favorable as anything I have ever known. I have found an application of warm lard, in cases of croup, very successful.

Dr. MARTIN.—I think the remedy suggested by the gentleman from Nantucket is much like the use of wine and molasses for a child when first born; it is a kind of nostrum. The fact is, it is not best to apply medicine to well people or cows. The salts will produce a copious evacuation from the bowels, and prevent the flow of milk to the bag; a good remedy when the cow is diseased; well cows do not need that. You should not make the cows abnormal by feeding too high. Heifers are often fed till they fill themselves so that they groan. When a cow actually has an inflamed bag, salts would be good; but I would not give it in ordinary cases. With ordinary cows the bag will not distend so as to do any harm. The system is more sensitive at this period, and takes inflammation more readily. The cause is the pressure of the blood and milk; and you want to remove the cause. I would rather give opium, for I should stop the pain and stop the inflammation. But you may stop the pain very much by bringing the bag up, for its weight increases the pain. But I advise you not to doctor your well cows; look out, and not make them sick. When you find your cows well developed, do not put them into good feed before calving the first time. Reduce the feed, give warm applications, and keep the bag suspended.

Mr. SMITH, of Middlefield.—I agree that prevention is what we want. I never feed any cows high until after they have come in and got all right. I am very careful about that, and I never had any cows give milk before they calved. The trouble comes from too high feed, I think. A cow should not be overfed for a few days before coming in. But I think an important matter is to get the milk all out of the bag. In nine cases out of ten I think the trouble comes from not doing that. Ordinarily, if you take pains, as soon as the cow calves, to get the milk all out, and continue to get it out, in due time there will be but little trouble. The best way is to milk the cow yourself, and then let the calf work at it. The work of the calf is just right. He will wet the bag all over, and work at it longer than you can have patience to do. He will knock the plugs out for you. I never lost a cow in that way, nor had any trouble. I have had some trouble from garget, which I think is a distinct thing. It may be from a rupture in the bag caused by pressure, and this comes in the case of the best cows. The difficulty is, you have no warning till it comes. It is a good plan to milk as many as three times a day, so as to prevent the strain. An excellent application is the common spearmint and lard, simmered together, so as to form an ointment. I would prevent the necessity for the use of anything of this kind if possible; but if any application is needed, this is excellent.

As to the fouls, or hoof-ail, there are many remedies.

The PRESIDENT.—Do you regard the fouls and foot-ail as the same thing?

Mr. SMITH.—I am not certain about that. I find cattle take them in the same way. You let young cattle run together, and they all have it. I think they get it from being in muddy or clayey pastures. But we never get it in our pastures nor have it, unless it is brought there in some herd. We often have cattle from the clayey pastures of New York, that bring it with them. For cattle that are just beginning to have it, I find spirits of turpentine, or vitriol water, is good. I dilute oil of vitriol or sulphuric acid, about half, and work it in between the hoofs with a swab. They kick some; but the kicking helps work it in, and they are cured, generally, with a few applications. Cases of long standing are more difficult to cure; and when it gets among sheep, it is worse among the old sheep than the lambs; for it seems to get into the blood in time. I had one extremely severe case in which it seemed to be in the blood. I cured that by first getting the hoof perfectly clean, and applying vitriol water, and then giving sulphur. After being cured in that way I kept the animal three or four years, and he was not troubled with it again. I think the disease is taken by feeding over ground where the matter is left by the cattle or sheep that have gone over the grass before. It does not spread in the winter. Put a sheep that has it in among others in the winter, and they will not take it; but in the summer, in feeding over the same ground, they take it. My cattle all took it from that one which had it so severely. It took nearly six months before they all had it; but not one escaped.

Mr. PERKINS, of Becket.—I think we may come to some certain results with regard to caked bag. The point to be attained is to get the milk out. Salts will prevent milk being secreted; and by milking we keep it out.

I would suggest that the garget is only a continuation of the inflammation, and the first stages are not sufficient to produce garget. But when the inflammation is sufficient to produce plugs, they will produce suppuration, and finally garget. By reducing the inflammation we allow the suppuration to pass out through the teats. I think we have all come to agree on the remedy in one thing, and that is, warm applications. I think they are very much the best. The molasses, turkey oil, warm water and friction all have a tendency to produce heat. All may be reckoned as warm applications, and I don't know as there is any difference between. Whether you apply sulphur with or without the oil, it don't make any difference, for it is only an application of something that keeps out the atmosphere.

Mr. HUBBARD.—Does the gentleman wish to keep the heat in?

Mr. PERKINS.—The best way is to apply warm things. I had an inflamed knee, and I had such applications made as kept the heat in, and I believe it saved my life. I believe that applications of hot pepper tea, mustard paste, and such hot things, are the best to save life, in many cases.

Mr. FLINT.—Dr. Thayer, who has had a good deal of experience with cattle diseases, prepared a very excellent article on the subject of the garget, which I liked very much. I do not recollect it definitely, but the amount of it was that hot applications and a constant rubbing of the bag should be thoroughly tried, and afterward the bag should be rubbed dry and then swayed up. I believe that is a very important thing. It must be apparent that the heavy udder, in a state of inflammation, with milk constantly flowing into it, must produce much pain. The very weight of the udder increases its own natural inflammation, and it goes on becoming more inflamed as the milk comes in; so that anything which will tend to reduce the inflammation, tends to promote a cure. After using the hot water, and after rubbing the bag thoroughly dry with the woollen cloths, he then prepared a sort of bandage to go up over the rump and prevent the strain, and thus relieve the inflammation. When the bandage is inclined to slip forward he makes another, attaching it in such a way that it will stay in the proper place. And then you can put on woollen cloths, or anything that will keep the udder warm. That is the most successful treatment, I think, in the early stages of the disease.

Then Dr. Thayer alluded to two more confirmed cases, in which he prefers to use iodine, in some form. In diseases of the mammary glands iodine was usually very effective.

A MEMBER.—It seems to me there is a great difference between garget and inflamed bag. There is no trouble in removing any inflammation from the bag; but I don't believe it is within the power of man to cure garget, because the glands are closed. A few years ago I thought I would know something about diseases of cattle. I studied Dr. Dadd and everybody else, and finally I became disgusted with myself for thinking I knew anything about the matter. I have used oils and iodine, and everything that could be named. At last I gave it up that I knew nothing about it. As a general thing, the cow that has the greatest strain on the glands has bloody milk. The garget I don't believe can be cured.

Mr. STONE, of Sturbridge.—I agree with the gentleman last up. I had a most excellent cow that was troubled with garget. I tried hot water, but could not stop the flow of milk. I applied to Dr. Richards and gave the remedies he prescribed, but could not cure her. She calved in April, and the disease came on in September. She had been milked regularly all the time. I sold her in December. The bag was running when I sold her. If that was the garget I believe it could not be cured.

Mr. THOMPSON, of Nantucket.—I would like to say a word about applying a remedy before you might think it was needed. Why do we vaccinate the human system to prevent the small-pox? If we take such a course with the human system, why may we not give a heifer a pound or a pound and a half of salts before we know she is going to have an inflamed bag or not? All of us agree that none of us can tell when and how this trouble is to come.

As to the high feeding being the cause of the trouble, I had a friend on our island who fed a cow on salt hay that had a bag terribly inflamed for three weeks, and the calf nursed all the time, and punched and bunted all he wanted to.

I had to reduce that inflammation by my method. It is not always, therefore, the best kept animal that has this trouble, as I know from that case and others that I have seen. We talk here about keeping the system down at the time of calving; but we will not do it. Men wish to get good results, and sometimes the cows come in with inflamed udders; but, as I think I have shown, it is not necessarily a consequence of the high feeding.

Mr. SMITH, of Middlefield.—Was the cow of which you spoke milked after the calf sucked?

Mr. THOMPSON.—Yes. The calf run with her all the time.

Mr. SMITH.—It is plain that the bag was not milked clean. A young heifer will not give down all her milk. I should expect trouble if I let a calf run with a cow like that.

Mr. THOMPSON.—I generally take away the calf as soon as I can. But I am confident there is such a thing as a heifer having a caked bag when she has had poor food.

Mr. SMITH.—I agree to that, because the bag has not been sufficiently cleaned out.

Mr. THOMPSON.—I will only say that if gentlemen will get Mr. Flint's book they will find there just about all the information they want. Dr. Thayer prescribed for an inflamed bag as follows: "A half ounce of iodide of potassium in three gallons of water. Then give one tea-spoonful of that liquid in a half pint of water three times a day. Also apply tincture of iodine with a pencil-brush over the parts affected."

Mr. JOHN M. SMITH, of Sunderland.—We have been instructed to-day by the remarks of Dr. Martin and others. But Mr. Thompson comes forward with an illustration that a cow that has no feed at all may have a caked bag. I have been interested in the discussion, but still, as each remedy has been suggested, I have been reminded of Mr. Flint's book, although there have been some new ideas presented here. I had a cow about twenty years ago that lost the use of one teat the year before I bought it, as I was told by the person of whom I bought her. Before she came in, for a short time, I commenced applying hen's oil two or three times a day, and rubbed it in thoroughly until the time of calving. I had no trouble at all with the cow.

I had another cow whose bag swelled some six or eight weeks after calving. She was fed with Indian meal and shorts, but not very high. I never let her have another calf, as I was convinced the garget could not be cured.

I think the foot-ail is analogous to the rot in sheep. They are contagious, and will go through a herd when they begin

The best remedy I had tried for it was turpentine and salt mixed and turned on. It is very penetrating, and a very convenient remedy to apply. But I have now settled down upon blue vitriol and vinegar. I think that drove the disease from my herd. Muriatic acid I tried once, but it is rather too powerful.

Mr. STONE, of Sturbridge.—I do not agree that this disease is contagious. I had an ox two years ago that had taken it, and it lasted him two or three months. I applied all these things, and they all failed. I had one heifer that had it and ran with the other cattle, but they did not have it. I have had another case of the same kind, where the animal that had it ran with others, but they did not have it.

Mr. CHAMBERLAIN, of West Brookfield.—I do not consider this disease contagious. I have bought cattle that I knew had it. I kept them with other stock and they did not take the disease. There is a difference in the kinds of foot-ail, you will find. One is called the blind fouls, and commences in the foot. You cannot cure that, but if it is on the outside it can be cured.

Mr. PERKINS.—A friend of mine bought some cattle at Springfield, and he wanted to turn them into my yard. I did not know but they were well. But soon after I found that my cattle were attacked with this disease, and I also learned that his cattle had it. If mine did not take it from those cattle from Springfield, I do not know where they did get it.

Mr. SMITH, of Sunderland, repeated that he believed the disease to be contagious. But while it is so, it is no sign that all cattle that are exposed will have it. We had no trouble with cattle that we kept at the barn year after year. The trouble was with cattle that we bought in.

Mr. BULL, of Harvard, returned to the consideration of caked bag, and said the man who would apply hot water, and then leave the animal exposed to the cold atmosphere, must be considered devoid of common sense. The bag must be rubbed gently and thoroughly till it is dry. I never would apply any oil until I knew the hot water failed to produce the desired result. If oil is applied, you may perhaps destroy the effect of the hot water.

Mr. BARNARD, of Worcester, repeated that he preferred turkey oil to hot water. He kept his cows in the stable, except when they were let out to drink. He thought the disease was brought on by lying on the ground and taking cold.

Mr. Capen, of Boston, explained the philosophy of hot applications to be that the subsequent evaporation carried off the heat. Rubbing, by increasing the circulation, allays the disease in the local part.

Mr. Homer, of Brimfield, asked permission to vary the course of thought for a moment, by reading a report of the result in fattening some pigs, as given by a neighbor of his, Mr. Sumner Parker. It is as follows:

STATEMENT ON PIGS.

Having been requested to give a statement of my management of pigs, the past season, I very cheerfully give the following:

Last May I purchased four pigs, which were then five weeks old, perhaps about half of the Chester County breed. I was at that time carrying my milk to the factory, to be made into cheese, which left me destitute of that kind of feed which I consider the best adapted for the young pig. But having the whey from my milk, I thought I would try and do the best I could with it. I commenced by putting a very little milk with the whey. The change of feed from the mother's milk to whey being so great that they did not do as well for the first two weeks as I could wish. But I persevered, and at length they began to grow. I had some small potatoes, and I commenced giving them a few at a time, raw, which they soon learned to eat very greedily. And my opinion is that they are worth more for the hog at that season of the year, fed in a raw state, than when cooked; at least, that is my experience. I gave them enough to keep them growing well, principally of whey and potatoes, until about the middle of August, when I put them into my hog house, upon a stone floor, and did not let them go to the ground at all, furnishing them with plenty of straw, and keeping their styes well cleaned. I then commenced to fat them, feeding them with barley, rye and corn, ground together, in equal parts, giving them their swill for awhile, and increasing the meal as I thought their stomachs and limbs would bear, being very careful not to over-feed at any time. I slaughtered them on the 14th of November—they then being just seven months and a half old—and their dressed and gross weight was as follows: No. 1, 312 pounds; No. 2, 315 pounds; No. 3, 340 pounds; No. 4, 362 pounds. Total, 1,329 pounds.

Mr. Garfield, of Lee.—I think the question is not well settled whether the foot-ail is contagious. I had one herd of eight cows, seven of which were affected with it, while the eighth had no appearance of it. These animals were kept in a pasture near other cattle, with nothing but a rail fence to separate them, but the disease did not spread. I have been led to the conclusion that it was not contagious, that it was some local poison. I wish we could better understand that question.

Mr. Hubbard.—I think I am one of the most favored ones of this Board. Among my own cattle I never had a case of the foot-ail. I don't think it would be best for me to give any of the remedies recommended here, for fear my cattle may have the disease. I think that for a caked bag the application of hot water and thorough rubbing is as good as anything.

Mr. Smith, of Sunderland.—I would like to inquire whether any of the Board are acquainted with rheumatism in cattle? I had a high grade heifer and a good milker, taken with stiffness in the hind parts, but had nothing of the "fouls." She was finally so much affected that she could scarcely get up. She grew thin and fell off in milk. She lay on a plank floor and I removed her to a stable that had no floor, and gave her sufficient bedding; and while there she rapidly improved. After she got better I put her back into the other stable, and the difficulty came on again. She did well so long as I kept her in a stable without a floor. She came in in April. The disease came on in the beginning of summer.

Mr. Davis, of Northborough.—I have had occasion to observe contagious diseases for a few years. The soreness of eyes which persons have in public institutions, sometimes is occasioned by the filth in which the men and women live, and their low condition. If they wash, and wipe on the same towel, they spread the disease. A person in good health, who does not do that, never has the disease, though he may be among them. We often meet people on the streets here that have sore eyes. If you stop them and put your finger in their eyes and then in your own, you will be likely to have the disease. This foot-rot is something of the same sort. Take cattle that have been kept in a low condition, they may take the disease by grazing over the ground where cattle that have the disease have passed.

Mr. BULL, of Harvard.—One of my neighbors (Mr. Sawyer,) had a cow that had swelled legs, first one side and then the other. I should like to have him state what his treatment was.

Mr. SAWYER, of Harvard.—I do not know as I can present the case satisfactorily; but there is a trouble which prevails almost to the destruction of our milk cows, in some cases. One of my neighbors has not had a living calf for a year. In the fall of 1863 I bought a heifer, expecting her to have a calf. She did not, and I sold her. She came back in the fall and I put her in the pasture, where she lay quite late in the season. I then put her up with the other cows. I tie my cows in stanchions, and I found, sometimes, that this heifer seemed weak when she tried to get up. She ate, and appeared well in other respects. She has not recovered yet. Some call it the bone disease, which produces a disposition to gnaw bones. My cows all lost their calves a short time before their time for calving. One lost hers about four months before the time. I fed them with a variety of things, to try to help the matter, such as oil meal, bean meal, shorts, corn meal, barley meal and ashes. I don't know but that kind of feeding caused the cow that lost her calf to do so. No one in our vicinity knows anything what to do for it. It affects, more or less, every animal in the herd where it gets in. I have lost five, and one of my neighbors lost seven or eight.

The Board then adjourned till half past two o'clock, P. M.

AFTERNOON SESSION.

The Board met pursuant to adjournment.

Mr. EDWARD A. SAMUELS, of Boston, addressed the Board on the

AGRICULTURAL VALUE OF BIRDS.

Gentlemen of the Board of Agriculture: It was suggested to me that I might, from the fact that I have paid considerable attention to the habits of our native birds, prepare a short lecture on them, with reference to their agricultural value, that would, perhaps, in a measure, be interesting to agriculturists and others, whose daily pursuits throw them into constant intercourse with these beautiful and interesting instruments in the great economy of nature.

I acted on the suggestion, and will now present a short paper on the Agricultural Value of Birds.

This subject has, until recently, received but a very small share of attention from scientific men and agriculturists generally; that it possesses a degree of interest, almost vital importance, hardly surpassed by others of the great branches of natural science, is by many appreciated. It is true that birds, as a class, have been considered as beneficial, and have been treated accordingly, but, until recently, no systematic inquiry, no regular analyses of the habits and foods of the different families have been made, to ascertain the practical relations which they bear to agriculture, and the fact is the more surprising when we reflect that the means of examination, the phenomena by which they might have been observed, have been constantly before us, among the objects of our most familiar intercourse. And it is a fact, that even now, in many sections of the country, even in our own State, many species, which have been ascertained beyond a doubt to be eminently beneficial, are regarded as injurious, and destroyed at every opportunity.

Of course, my present limits will not permit me to make an extended notice of the habits of all our different species of birds. I propose, merely, to give a brief review of the facts which have been discovered, bearing on agricultural economy, in the different *families*, together with such observations as I have myself made, with reference to this important subject, during the past few years.

Beginning with the rapacious birds, I will pass at once to the nocturnal birds of prey; for it is well known that the diurnal species, among which are included our eagles, hawks, kites, &c., are very mischievous in destroying the smaller beneficial birds, of which their food almost entirely consists.

The owls, as a class, are eminently beneficial. We have, in New England, about ten species, most of which are resident with us through the year. Of these species, as with the other birds, each has its favorite food and peculiar locality for hunting for it. For instance, the Great Horned Owl, or Cat Owl, as it is commonly called, prefers the deep solitude of the forest, where it preys on the larger rodents, the rabbits, hares, squirrels, and occasionally a stray partridge or a grouse. This species is the only one that is at all mischievous on the farm. He is unpopular with the farmer, from the fact that he occasionally makes a raid on the poultry, roosting on the trees and fences about the barn and poultry yard.

I have often shot this owl when his feathers were strongly scented with the peculiar smell of the skunk, and it is a fact that many of these animals fall victims to the hunger of this bird. I don't know but he is conferring a favor on the farmers in destroying them, for, although an insect-eater to a considerable extent, the skunk destroys great numbers of birds on their nests, their eggs and young ; and I really question whether the evil he thus accomplishes does not more than counterbalance the good he does in destroying the insects on which he feeds.

The Long-eared Owl—a smaller species than the Great Horned Owl—also seeks the same localities, but preys on the smaller rodents, the injurious wood mice, *Arvicolinæ*, whose injuries to the nurseries and orchards of this country, amount by estimation, to many millions of dollars annually. The Short-eared Owl and Barred Owl, both well known birds, haunt the meadows, marshes and low swampy woods, where they destroy multitudes of the injurious meadow-mice, which make these localities their homes through a great portion of the year. The little Saw-Whet Owl, and little Screech or Red Owl, both well-known species, frequent the orchards, gardens and nurseries, where they not only destroy the field mice, but capture immense numbers of the night-flying Lepidoptera, the injurious moths whose caterpillars commit such devastations throughout the country. We often notice, in walking through the fields, wings of some of the larger moths lying on the ground. In nine cases out of ten the insects are killed and eaten by these small owls. I have examined the stomachs of many of these birds, and they almost always contained insects (sometimes beetles and caterpillars,) and small mammals. Very seldom, indeed, have I found birds in them, or, in fact, in any of the other owls. Farmers, in many localities, have become aware of the friendly services rendered by these birds, and protect them as they occasionally meet them flitting about the haystack or shed, or find them, during the day, quietly reposing in a hollow tree in the orchard. And I have heard the remark made by an observing old farmer, that he had rather have an owl about his haystack and nursery than a cat, as he destroys more mice than one of these animals, and kills no beneficial birds.

The next family, in the regular system in which the birds are arranged by our ornithologists, is that of the Cuckoos. These birds, of which we have but two species, are pretty well known, and their merits appreciated, although many persons have a great antipathy for them, from the fact that they destroy young birds and eggs. I have known of instances of their so doing, but I think, that from their cowardly nature, they are not of common occurrence. I have frequently seen the common song sparrow drive one from the neighborhood of its nest, and other small birds seem equally to be a match for it. Probably if the parent bird were absent from the nest the cuckoo would rob it at once, but if she were present he would probably not molest her.

The cuckoos are extremely beneficial; they destroy and eat with avidity many of the caterpillars which most other species reject. For instance, the cuckoo feeds largely on the caterpillar of the common apple-tree moth. I have known of many instances where a nest has been completely destroyed by this bird. Probably some of the gentlemen present have observed this bird standing on the silky covering for the legions within, tearing it with his bill, and seizing and swallowing caterpillar after caterpillar, and even noticed him repeat his visits to the same locality until the whole colony is depopulated. I am informed that the canker-worm is also greedily eaten by this bird. If so, and I have no doubt of the fact, he is at once established as a public benefactor, for this insect has already become one of the most serious scourges known to horticulturists.

Another valuable family of birds on the farm are the Woodpeckers. As is well known, they subsist principally upon the larvæ of the tree-beetles or borers, which they obtain by picking holes in the trunk and branches of the trees, and thrusting in their long-barbed tongues and drawing the vermin from their lurking-places. Some of these woodpeckers have at times been regarded as injurious, from the fact that they are called, in some localities, sap-suckers, from the mistaken opinion that they suck the sap and eat the soft inner bark of some of the trees. One species, the yellow-bellied woodpecker, in particular, has thus been stigmatized, and it is of this species that I wish to speak more particularly. We can hardly take up an agricultural paper, particularly from the Western States, but that we notice some long account of the depredations of this bird; and the prejudice is so wide-spread against it that no opportunity is lost for its destruction. I believe that the complaint against it is absolutely unfounded, for if the bird is gifted with a peculiar conformation of the tongue, to enable it to suck or pump out the sap from a tree, why is it not apparent, why does it not, on examination, contain in its stomach quantities of the liber and cambium, instead of insects, like all of its cousins? Let us see what those great fathers of American ornithology, Wilson and Audubon, testify to with regard to this bird, and then see how far those are justified whose prejudices carry them to the destruction of this bird.

Audubon says:—"The yellow-bellied woodpecker prefers the interior of the forest during the spring and summer, seldom showing itself near the habitations of man at those seasons. It is a shy and suspicious bird, spending most of its time in trees which have close branches and dense foliage. I have never observed one of these birds on the ground. Their food consists of wood-worms and beetles, to which they add small grapes and various berries during autumn and winter, frequently hanging head downwards at the extremity of a small bunch of grapes."

Wilson says:—"This beautiful species is one of our resident birds (in Pennsylvania.) It visits our orchards in the month of October in great numbers, is occasionally seen during the whole winter and spring, but seems to seek the depths of the forest to rear its young in, for during summer it is rarely seen among our settlements; and even in the intermediate woods I have seldom met with it in that season." He continues, "the habits of this species are similar to those of the hairy and downy woodpeckers, with which it generally associates." In describing it, he says: "The tongue is flat, horny for half an inch at the tip, pointed, and armed along its sides with reflected barbs. The principal food of these birds is insects, and they seem particularly fond of frequenting orchards, boring the trunks of the apple-trees in their eager search after them. On opening them, the stomach is found generally filled with fragments of beetles and gravel." He says:—"The habits of this species are the same as those of the hairy and downy woodpeckers." Of the latter, he says:—

"The principal characteristics of this little bird are diligence, familiarity, perseverance, and a strength and energy in the head and muscles of the neck which are truly astonishing. Mounted on the infected branch of an old apple-tree, where insects have lodged their corroding and destructive brood in crevices between the bark and the wood, he labors sometimes for half an hour at the same spot before he has succeeded in dislodging and destroying them. At these times you may walk up pretty close to the tree, and even stand immediately below it, within five or six feet of the bird, without in the least embarrassing him."

The strokes of his bill are heard distinctly several hundred yards off, and I have known him to be at work for two hours together on the same tree. The eagerness with which he traverses the upper and lower sides of the branches, the cheerfulness of his cry, the liveliness of his motions while digging into the tree and dislodging the vermin, attest to the fact that the description by Buffon, that his life is but a dull and insipid existence of incessant toil and slavery, is far from the truth.

In fall and winter he associates with the titmouse, creeper, &c., both in their wood and orchard excursions, and usually leads the van. Of all our woodpeckers, none rid the apple-trees of so many vermin as this, digging off the moss which the negligence of the proprietor had suffered to accumulate, and probing every crevice. In fact, the orchard is his favorite resort.

"In fall he is particularly fond of boring the apple-trees for insects, digging a circular hole through the bark just sufficient to admit his bill; after that a second, third, &c., in pretty regular horizontal circles round the body of the tree; these parallel circles of holes are often not more than an inch, or an inch and a half apart, and sometimes so close together that I have covered eight or ten of them at once with a dollar. From nearly the surface of the ground up to the first fork, and sometimes far beyond it, the whole bark of many apple-trees is perforated in this manner, so as to appear as if made by successive discharges of buckshot; and our little woodpecker is the principal perpetrator of this supposed mischief. I say *supposed*, for so far from these perforations of the bark being ruinous, they are not only harmless, but, I have good reason to believe, really beneficial to the health and fertility of the tree. I leave it to the philosophical botanist to account for this, but the fact I am confident of. In more than fifty orchards which I have myself carefully examined, those trees which were marked with the woodpecker (for some trees they never touch, perhaps because not penetrated by insects,) were uniformly the most thriving, and seemingly the most productive. Many of these were upwards of sixty years old, their trunks completely covered with holes, while the branches were broad, luxuriant, and loaded with fruit. Of decayed trees, more than three-fourths were untouched by the woodpecker. Several intelligent farmers with whom I have conversed, candidly acknowledge the truth of these observations, and with justice, look upon these birds as beneficial; but the most common opinion is, that they bore the trees to suck the sap, and so destroy the vegetation; though pine, and other resinous trees, on the juice of which it is not pretended they feed, are often found equally perforated. Were the sap of the tree their object, the saccharine juice of the birch, the sugar-maple, and several others, would be much more inviting, because more sweet and nourishing than that of either the pear or apple tree; but I have not observed one mark upon the former, for ten thousand that may be seen on the latter. Besides, the early part of spring is the season when the sap flows most abundantly, whereas it is only during the months of September, October, and November that they are seen so indefatigably engaged in orchards, probing every crack and crevice, boring through the bark, and what is worth remembering, chiefly on the south and south-west sides of the tree, for the eggs and larvæ deposited there by the countless swarms of summer insects. These, if suffered to remain, would prey upon the very vitals, if I may so express it, of the tree, and in the succeeding summer give birth to myriads more of their race, equally destructive."

Here, then, is a whole species, I may say genus, of birds, which Providence seems to have formed for the protection of our fruit and forest trees from the ravages of vermin, which every day destroy millions of those noxious insects that would otherwise blast the hopes of the husbandman, and which even promote the fertility of the trees; and, in return, are proscribed by those who ought to have been their protectors, and incitements and rewards held out for their destruction! Let us examine better into the operations of nature, and many of our mistaken opinions and groundless prejudices will be abandoned for more just, enlarged, and humane modes of thinking.

Audubon, in describing the habits of the same bird, says: "This woodpecker, which is best known in all parts of the United States by the name of sapsucker, is, perhaps, not surpassed by any of its tribe in hardiness, industry, or vivacity. If you watch its motions while in the woods, the orchard, or the garden, you will find it ever at work. It perforates the bark of trees with uncommon regularity and care, and, in my opinion, greatly assists their growth and health, and renders them also more productive. Few of the farmers, however, agree with me in this respect; but those who have had experience in the growth of fruit trees, and have attended to the effects produced by the boring of this woodpecker, will testify to the accuracy of my statement. This species is met with, during summer, in the depth of the forest, as well as in the orchard and the garden. In winter, it frequently visits the wood-pile of the farmer, close to his house, or resorts to his corn-crib, where, however, he does but little damage. Their food, during summer, consists of insects and their larvæ, but, at the approach of autumn, they feed on some berries, small grapes, and the berries of the poke-weed. The extensile portion of the tongue of this species, as well as of the Yellow-bellied Woodpecker, Hairy Woodpecker, and others, is cylindrical or vermiform, while the extremity, or tongue itself, is linear, flat above, convex beneath, with projecting edges, which are serrated backwards, the tip pointed." We are unable to distinguish any preference for either of these species of woodpeckers in the accounts given by both of these eminent naturalists, and, that they should not have noticed any bad traits, if such had existed, is remarkable, living, as they did, with the birds through the year, and carefully observing and studying their habits. I once got abused roundly by a writer in one of the Western papers, for speaking a good word for the sapsucker. Whether or not there were good grounds for his so doing, I leave it to the candid and unprejudiced to say. I am satisfied with my reasons.

Passing by the small family of the Caprimulgidæ, in which are included our Night-hawk and Whip-poor-will, and also the great family of flycatchers, of which the King-bird, Pe-wee and least flycatcher are familiar types; all of which are well known to be beneficial since they subsist entirely upon insects, we come to the great family of thrushes. It is of these that I wish to speak particularly here, since no birds have caused more discussion than these, and none have been more belied than the robin, who is a familiar representative of this important group.

These birds are very unpopular with horticulturists, and hardly an agricultural paper can be found but that an article appears in its columns against them. I will present a few of these attacks, and answer them with the observations of eminent scientific men and practical farmers, together with my own knowledge in the premises.

A writer in the "New England Farmer," vol. x., page 542, says: "Self-defence is the first law of nature, and wild animals and birds, which are a positive injury to man, it is his right and duty to destroy, 'legislative enactment notwithstanding.' The law forbids manslaughter, yet self-defence permits it. Man's title deeds allow him the ownership of all the animals and birds that infest his premises, yet the law declares, that he shall suffer its penalties if he destroys one of them. If it was the intention of the law to put an end to the wanton destruction of all birds, then the law was a just one, but if it was intended that a landholder should harbor a band of robbers, then it is an unjust one.

"Let us enumerate some of the injuries that we are every year receiving, and some of them are entailed even to the third or fourth generation of man. The destructive propensities of the robin are such, that, after doing all the damage he possibly can in the garden, by partaking, not alone of what he may need, but by pecking at all the fair and sound fruit, commencing with the strawberry, raspberry, cherry and peach; none, even of the new and choice varieties of the blackberry, can be gleaned in his neighborhood, as they ripen so slowly, that his dividend is both principal and interest. After doing all this mischief in the garden, he betakes himself to the rich pasture land, and there riots in untold injuries to us. He is the enemy that sows tares when we are in the land of dreams, and our legislative bodies are hedging him around with the impregnable barriers of the law. An enumeration of his labors in pasture land will not be inappropriate here. First, he distributes the seed of low blueberry, wild blackberry, barberry, savins, garget, &c. Red cedars, sweet ferns, wild cherry, are also found. This may be questioned by some; to such I would advise that they would examine their droppings, which may be abundantly found on walls, and they will find that the germ of the seed is not killed in passing them. Most of the pastures in the south-east part of this county (Essex,) are full of ledges, or very stony, at least, so much so, that it is a very serious undertaking to plough them. Mowing only aggravates the disease, causing the roots to sprout at their termini, which greatly aid the spreading of these plants, whose seeds have been scattered by birds." This correspondent continues in the same strain; attempts to argue that the depreciation of pasture land in value forty per cent., and the appreciation of mowing lands over one hundred per cent., and the rise of butter, &c., in the same proportion, is owing to the labors of this bird. We will see shortly how far this gentleman is justified in his position. In passing from his letter I would call attention to the fact, that while asserting that the robin scatters broadcast the seeds of noxious plants, he does not say that he performs a like office for the valuable ones; and is it not singular that the digestive organs of the bird should be able to make this discrimination, for I have never yet met with any of the plants of the valuable fruits which must have been transplanted, if the gentleman's theory is correct, from our gardens and orchards, through the bird, and I doubt if any well authenticated instance can be found of such. I have one more letter in a similar strain, but more abusive. It was published in the "Prairie Farmer" for Oct. 14, 1865. The following extract bears on the present subject. He says, in comparing the robin with the blue jay:

"I could not affirm, in any court of justice, that I ever saw a blue jay touch berry or grape. Not so as to corn. Indeed, in my first farming experience, I caught, tried, condemned and executed twenty of them in one morning. I remember the slaughter with shame, and meekly submitted to the almost deafening protest of a hundred survivors. They are now welcome to their corn, for from year's end to year's end, they abide in the grove around the house, not leaving, like the robin, when they can no longer stuff themselves on my choicest fruits. At all hours of the day I see them visiting every leaf for insects. In the winter, they forsake us not, like their fellows; and, when bird-notes are scarce, their shrill, liquid, half harsh and half sad ones, are not unwelcome. When it comes to insolence and swagger, the robin takes the rag. Add to insolence and swagger a gluttony as never ending and insatiable as it is destructive, and you have the character of the meanest thief and *hog* that goes on wing. They have no decency, no honor, and when driven from their work, or kept from it, we defy all bird kind to put on insolence more noisy and aggravating. They commenced on the cherry tree as soon as colored. We took a suit of *our own clothes*, put in a face to match, and hung it pendant in a tree. The next morning there were several thousand of the scoundrels in the tree, and one on the hat. The truth is, nothing but shot will protect choice fruits from the robin. There is no stop to their eating. As soon as the berries are gone, presto, they all leave. There has been no sight or sound of one for weeks. Call you this compensation for large amounts of choice fruits destroyed ? We do not kill birds, have no gun, but had we a musket at hand when choice cherries are coming into bearing, we should have no scruples about sending a few robins to pot, or kingdom come. We had rather have a hundred blue jays about than ten robins. The one is not more overbearing and quarrelsome than the other."

Now it is just this kind of letters, published in different papers, that keep up the prejudice among the farmers, who have, perhaps, no time to look far into the subject, but, taking the leading features in these letters, together with their own experience, as the *whole* truth, sacrifice the robins and other beneficial birds without mercy. They accuse him of living upon fruit and earthworms alone, alleging that he destroys but very few of the insects injurious to vegetation. Nothing can be farther from the truth, for he is, in fact, one of the most valuable of our birds, exceeded only, perhaps, by the small woodpeckers and the chickadee and warblers in the service he performs by checking the multiplication of noxious insects.

As an instance of the insect-eating propensities of the robin, I will give, among others, the experience of Mr. Trouvelot, of Medford. This gentleman is engaged in rearing silkworms for the production of silk. He has a tract of about seven or eight acres inclosed and mostly covered with netting. He is obliged, in self-defence, to kill the birds which penetrate into the inclosure and destroy the worms. Through the season, probably ten robins for one of all others thus molest him, and of scores of these birds which he has opened and examined, none had any fruit or berries in their stomachs—nothing but insects. It is to be understood that this was not in a part of the summer when berries were not ripe; on the contrary, it was all through the season. His land is surrounded with scrub-oaks and huckleberry bushes. These latter were loaded with fruit, which was easier of access to the birds than the worms, but none were found in them. He says they came from all quarters to destroy his silk-worms, and gave him more trouble than all the other birds together. He said that, in his opinion, if the birds were all killed off, vegetation would be entirely destroyed. To test the destructiveness of these marauders, as he regarded them, he placed on a small scrub-oak near his door two thousand of his silk-worms. (These, let me say, resemble, when small, very closely the young caterpillar of the apple-tree moth.) In a very few days they were all eaten by cat-birds and robins, (birds closely allied, and of the same habits.) This was in the berry season, when an abundance of this kind of food was easily accessible, but they preferred his worms. Why? Because the young of these, as well as those of most other birds, *must* be fed on animal food. Earth-worms assist in the regimen; but how often can birds like the robin, cat-bird, thrush, &c., get these? Any farmer knows that when the surface of the ground is dry they go to the sub-soil, out of the reach of birds; and it is not necessary here to say what proportion of the time the ground is very dry through the summer. Caterpillars, grubs of various kinds, and insects therefore constitute the chief food of these birds; and of these, caterpillars and grubs being the most abundant, and most easily caught, of course furnish the larger proportion.

I will show, shortly, that by the observations of eminent scientific men it has been proved that such is the fact. The thrushes seem designed by nature to rid the surface of the soil of noxious insects not often pursued by most other birds. The warblers capture the insects that prey on the foliage of the trees; the fly-catchers seize these insects as they fly from the trees; the swallows capture those that have escaped all these; the woodpeckers destroy them when in the larvæ state in the wood; the wrens, nuthatches, titmice and creepers eat the eggs and young that live on and beneath the bark; but the thrushes subsist on those that destroy the vegetation on the surface of the earth. They destroy nearly all kinds of grubs, caterpillars and worms that live upon the green sward and cultivated soil, and large quantities of crickets and grasshoppers before they have become perfect insects. The grubs of locusts, of harvest-flies and of beetles, which are turned up by the plough or the hoe, and their pupæ when emerging from the soil; apple-worms when they leave the fruit and crawl about in quest of new shelter; and those subterranean caterpillars, or cut-worms, that come out of the earth to take their food; all these, and many others, are eagerly devoured by the robin and other thrushes. The cut-worms emerge from the soil during the night to seek for food, and the robin, which is one of the earliest birds to go abroad in the morning, is very diligent at the dawn of day in hunting for these vermin before they have gone back into their retreat. The number of these destructive grubs is immense. "Whole cornfields," says Dr. Harris, "are sometimes laid waste by them. Cabbage-plants, till they are grown to a considerable size, are very apt to be cut off and destroyed by them. Potato-vines, beans, beets, and various other culinary plants, suffer in the same way." The services of the robins, in destroying these alone, would more than pay for all the fruit they devour. Indeed, during the breeding season, a robin is seldom seen without one of these caterpillars, or some similar grub, in his mouth, which he designs for his young; and as the robin often raises three broods of young during the season, his species must destroy more of this class of noxious insects than almost all other birds together. In my own gardening experiences, I have had my full share of cut-worms, and I have always noticed, as many gentlemen present undoubtedly have, the robin, brown thrush and cat-bird busy early in the morning, almost before other birds are out of their feather-beds, figuratively speaking, catching these vermin and eating them, or carrying them for food to their young.

Let us see what scientific men have observed concerning the food of the robin. At a meeting of the Boston Society of Natural History, a communication was read from Professor Treadwell, of Cambridge, giving a detailed account of the feeding and growth of this bird during a period of thirty-two days, commencing with the 5th of June. The following is the substance of this report:—

When caught, the two were quite young, their tail feathers being less than an inch in length, and the weight of each about twenty-five pennyweights, less than half the weight of the full-grown birds; both were plump and vigorous, and had evidently been very recently turned out of the nest. He began feeding them with earth-worms, giving three to each bird that night. The second day he gave them ten worms each, which they ate ravenously. Thinking this beyond what their parents could naturally supply them with, he limited them to this allowance. On the third day he gave them eight worms each in the forenoon, but in the afternoon he found one becoming feeble, and it soon lost its strength, refused food, and died. On opening it, he found the crop, gizzard and intestines entirely empty, and concluded, therefore, that it died from want of sufficient food, the effect of hunger being increased, perhaps, by the cold, as the thermometer was about sixty degrees.

The other bird, still vigorous, he put in a warmer place, and increased its food, giving it the third day fifteen worms, on the fourth day twenty-four, on the fifth twenty-five, on the sixth thirty, and on the seventh thirty-one worms. They seemed insufficient, and the bird appeared to be losing plumpness and weight. He began to weigh both the bird and its food, and the results were given in a tabular form. On the fifteenth day he tried a small quantity of raw meat, and finding it readily eaten, increased it gradually, to the exclusion of worms. With it the bird ate a large quantity of earth and gravel, and drank freely after eating. By the table, it appears that though the food was increased to forty worms, weighing twenty pennyweights, on the eleventh day, the weight of the bird rather fell off; and it was not until the fourteenth day, when he ate sixty-eight worms, or thirty-four pennyweights, that he began to increase. On this day the weight of the bird was twenty-four pennyweights; he therefore ate forty-one per cent. more than his own weight in twelve hours, weighing after it twenty-nine pennyweights, or fifteen per cent. less than the food he had eaten in that time. The length of these worms, if laid end to end, would be about fourteen feet, or ten times the length of the intestines.

To meet the objection that the earth-worm contains but a small quantity of nutritious matter, on the twenty-seventh day he was fed exclusively on clear beef, in quantity twenty-seven pennyweights. At night the bird weighed fifty-two pennyweights, but little more than twice the amount of flesh consumed during the day, not taking into account the water and earth swallowed. This presents a wonderful contrast with the amount of food required by the cold-blooded vertebrates, fishes and reptiles, many of which can live for months without food, and also with that required by mammalia. Man, at this rate, would eat about seventy pounds of flesh a day, and drink five or six gallons of water.

The question immediately presents itself, how can this immense amount of food required by the young birds be supplied by the parents? Suppose a pair of old robins, with the usual number of four young ones. These would require, according to the consumption of this bird, two hundred and fifty worms, or their equivalent in insect or other food, daily. Suppose the parents to work ten hours, or six hundred minutes, to procure this supply; this would be a worm to every two and two-fifths minutes; or each parent must procure a worm or its equivalent in less than five minutes during ten hours, in addition to the food required for its own support.

After the thirty-second day the bird had attained its full size, and was intrusted to the care of another person during his absence of eighteen days. At the end of that period the bird was strong and healthy, with no increase of weight, though its feathers had grown longer and smoother. Its food had been weighed daily, and averaged fifteen pennyweights of weight, two or three earth-worms, and a small quantity of bread each day, the whole being equal to eighteen pennyweights of meat, or thirty-six pennyweights of earth-worms; and it continued up to the time of the presentation of the report. The bird having continued in confinement with certainly much less exercise than in the wild state, to eat one-third of its weight in clear flesh daily, he concludes that the food it consumed when young was not much more than must always be provided by the parents of wild birds. The food was never passed undigested; the excretions were made up of gravel and dirt, and a small quantity of semi-solid urine

He thought that every admirer of trees may derive from these facts a lesson, showing the immense power of birds to destroy the insects by which our trees, especially our apple, elms and lindens, are every few years stripped of their foliage, and often many of them killed. "The food of the robin," he says, "while with us, consists principally of worms, various insects, their larvæ and eggs, and a few cherries. Of worms and cherries they can procure but few, and those during but a short period, and they are obliged, therefore, to subsist principally upon the great destroyers of leaves—canker-worms, and some other kinds of caterpillars and bugs. If each robin, old and young, requires for its support an amount of these equal to the weight consumed by this bird, it is easy to see what a prodigious havoc a few hundred of these must make upon the insects of an orchard or nursery. Is it not, then, to our advantage," he asks, "to purchase the service of the robins at the price of a few cherries or berries? Most certainly; and a Worcester County horticulturist says he is willing to give the robins a *bushel* of cherries apiece for the good they do, should they require so many."

Wilson Flagg, an acute and careful observer of the habits of our birds, gives some of his experiences of the robin as follows. He says: "Before I had investigated the habits of this bird, with particular reference to the service he renders to agriculture, I supposed he was only of secondary importance, compared with the blackbird and others that possess the faculty of discovering and seizing the grubs that lie concealed beneath the surface of the ground. Though the robin does not possess this faculty, he is pre-eminently serviceable in other ways; and the more I have studied his habits the more I am convinced of his usefulness. Indeed, I am now fully pursuaded that he is valuable beyond all other species of birds, and that his services are absolutely indispensable to the farmers of New England. Some persons believe that the robin is exclusively a frugivorous bird, and that for fruit he will reject all other food that is within his reach. Others believe that his diet consists about equally of fruits and angle worms, but that he is not a general consumer of insects. The truth is, the robin is almost exclusively insectivorous, and uses fruit as we do, only as a dessert, and not for his subsistence, except in the winter, when his insect food cannot be obtained. He is not omniverous, like the crow, the jay, and the blackbird.

He rejects farinaceous food unless it is artificially prepared, derives almost his entire support from insects and grubs, and consumes, probably, a greater variety of species than any other bird. I am entirely at a loss to account for this very prevalent and mistaken notion respecting the frugiverous habits of the robin."

"Early in May," he says, "my son caught and caged three young robins, and I encouraged him in the act, that I might be enabled to study their habits of feeding. He commenced by feeding them with angle worms and soaked bread, giving them the latter very sparingly. They soon died, evidently from an excess of the farinaceous part of their diet. He then took three others from different nests, and fed them more exclusively on worms, and some fruit. Two of these, also, soon died, and the remaining one appeared ill and drooping. I suggested that the bird probably needed insects as well as worms, which alone were not sufficient to supply all the wants of the system, though he had access to cherries and soaked bread, of which he could eat whenever he wanted them. After this he was supplied with all sorts of grubs and insects which my son was able to capture. The robin devoured these indiscriminately and with great eagerness. He was never known to refuse one of any description. All kinds of beetles, moths, bugs, grubs, vine worms, chrysalids and caterpillars, which were presented to him, he devoured. After this improvement of his diet, the bird soon recovered his health, and the experiment proved conclusively that this variety of insect food was necessary to the life of the bird, at least while he was young."

"These insects were not put into his mouth; they were placed upon the floor of his cage, and he picked them up, *killing them in a way that showed that he knew instinctively how to manage them.*"

"He was particular in beating the vine worm considerably before he swallowed it; but he never refused one, or neglected to eat it. On one occasion, having swallowed a hard beetle, and finding it incommodious, he threw it out of his crop by a voluntary effort, beat it awhile with his bill against the floor, and then swallowed it again. This fact also proved his instinctive knowledge of the mode of proceeding in such emergencies."

"It is a fact worthy of notice that the Baltimore Oriole, or Golden Robin, which has the reputation of performing more service than the common robin, may, when confined in a cage, be fed almost entirely on farinaceous food, without injury to his health. This fact is good evidence that the common robin is more entirely insectivorous than the other. The contrary is generally believed. The fondness of the robin and others for fruit is not peculiar to his species; it is equally remarkable in almost all other insectivorous birds.

"The birds that do not eat these small fruits are generally of those species which are the least valuable to agriculture, such as the graminivorous birds, including most of the finches.

"The truth is, that nature does not afford us a benefit without exacting pay for it. Hence, if a bird is particularly useful to our fields, he is sure to devour some portion of their produce. We must be content to pay them for their services, as we pay a hired man for cleaning our trees of borers and caterpillars. If it were possible to obtain an exact estimate of the services performed by the robin, we would be willing to pay him more than the full value of what he steals, rather than dispense with his services. At present, however, it must be confessed that the robin tax falls chiefly upon those who raise cherries and other small summer fruits. This is an evil which must be patiently endured for the common good. There are only two remedies of the evils to those who happen to be the unfortunate owners of cherry-trees; the first is, to cut down all the trees on one's ground, the second, to induce others to plant cherry-trees in as great numbers as possible.

"The extermination of the robins is out of the question, as it would hardly be advisable to sacrifice the interests of the staple products of agriculture to preserve a few bushels of cherries."

Passing rapidly by the warblers, which, as I before observed, subsist upon insects which they capture in and among the foliage of trees and shrubs, the swallows, which seize those flying insects that escape from the other birds nearer the earth, the cedar-bird, that, equally with the robin, is a friend to the farmer, the vireos and wrens, whose services are generally well appreciated and admitted, we come to those well-known little birds, the Creepers and Titmice. Of these latter, the little Black-cap Titmouse, or chickadee, is probably the best known; but few, however, really are aware of the great amount of valuable services he renders through the year in the destruction of noxious insects. And, indeed, in some localities, he is regarded as injurious, from the fact that he is often seen among the branches and leaves of the fruit trees and shrubs, pecking off and destroying the buds. Many gentlemen present have doubtless observed this bird twist a bud from a twig, nibble it a little, and then drop it. It does not do this for the bud for food, but really for the grub contained in it. If these buds be examined after the chickadee has thrown them away, there will appear the burrow of a grub or caterpillar in the very heart of them. The bird is able to discover the presence of these vermin much more readily than man could, and he is thus able to assail it at a period of its existence when it is doing the most harm. But it is not the insects and their larvæ alone that he destroys. His microscopic eyes enable him to discover their eggs deposited on and in the crevices of the bark and in the buds, and in an instant he can destroy the whole future brood. The eggs of the moth of the destructive leaf-rolling caterpillar, those of the canker-worm, the apple-tree moth, and others of these well-known plagues, are greedily eaten by him, and this in the inclement winter, when most of our other birds have abandoned us for a more genial climate.

In the summer time his labors are more easily noticed; and as he raises a large brood of young, the female laying six or eight eggs at a litter, he is very busy through the whole day in capturing vast quantities of caterpillars, flies and grubs. It has been calculated that a single pair of these birds destroy, on the average, not less than five hundred of these pests daily, a labor which could hardly be surpassed by a man, even if he gave his whole time to the task.

"Moreover, the man could not be as successful at so small a cost; for, setting aside the value of his time and the amount of a laborer's daily wages, he could not reach the denser and loftier twigs on which the caterpillars revel, and which the titmouse can traverse with perfect ease. No man can investigate a tree and clear it of the insect hosts that constantly beleaguer it, without doing some damage to the buds and young leaves by his rough handling; whereas the chickadee trips along the branches, peeps under every leaf, swings himself round upon his perch, spies out every insect, and secures it with a peck so rapid that it is hardly perceptible."

In some observations made on the habits of this and some other birds in Paris, it was found that the chickadee destroys, at the lowest computation, over 200,000 eggs alone of noxious insects in the course of a year. That one small bird is thus able to accomplish so much good in destroying these myriads of vermin, is an appeal to the good sense of the farmer for the protection of the *whole class* that should not be slighted.

Passing by the larks and finches and sparrows, which, although principally seed-feeders, nevertheless destroy great numbers of insects, we come to the Orioles, Blackbirds and Grackles. I have already noticed the former of these, and will give a moment to the blackbirds. These birds, like the thrushes, have caused much discussion, and many persons are prejudiced against them; but they are really beneficial.

The number of grasshoppers and crickets these birds destroy is astonishing; but these by no means constitute the whole of their food, for they pursue those subterranean caterpillars, the cut-worm, and grubs of other noxious insects, like the dor-bug or May beetle, with relentless vigor. I have had the curiosity, many times, to watch the common swamp or red-wing blackbird in his operations against these vermin. This is easily done with a glass, or by secreting one's self in thick foliage of bushes.

These grubs, working beneath the surface of the soil, give evidence of their presence by the wilted vegetation of the plants whose roots they have devoured. The least sound causes them to remain perfectly still in the earth, and as the burrows which they have made are sometimes many inches in length, it is not easy to ascertain their exact whereabouts. The blackbird, on perceiving one of these withered patches, quickly alights on its edge, and walks very quietly to each of the little tufts of grass that are cut off. If the grub is there, he is only covered to the depth of perhaps a half inch. This the bird quickly removes with his beak, when, if the worm is discovered, it is quickly seized, shaken to pieces and swallowed. If the grub is not found at once the blackbird continues his researches until successful.

The number he thus destroys I have known often to exceed thirty in the space of fifteen minutes. The amount necessary to rear the young family must be immense. Each female lays four or five eggs at a litter, and often rears two broods in a season. If we may judge by the appetite of the young robin that I just noticed, and there is no reason to say we cannot, the labors of the blackbird in rearing his young family are worthy of his receiving better treatment than he too often does at the hands of the farmers.

Buffon's reminiscence of the introduction of the grackle into the Isle of Bourbon, although familiar to many present, is still interesting, as it bears almost directly upon the present subject. The grackle is nearly allied to our blackbirds. On this island, "where the grackle was unknown, the soil was overrun with locusts, which had been accidentally introduced from the Island of Madagascar, the eggs having been imported in the soil with which some plants were brought from that island. The governor-general and the intendant deliberated seriously on the means of extirpating these noxious insects, and for this purpose caused several pairs of the Indian grackle to be introduced into the island. This plan promised to succeed; but, unfortunately, some of the colonists seeing the birds eagerly thrust their bills into the earth of the newly-sown fields imagined they were in quest of grain, and reported that the birds, instead of proving beneficial, would be highly detrimental to the country. On the part of the *birds*, it was argued that they raked in the newly ploughed grounds, not for the sake of the grain, but for the sake of the insects, and were, therefore, beneficial. They were, however, proscribed by the council, and in the space of two hours after the sentence was pronounced against them not a grackle was found on the island. This prompt execution was followed by a speedy repentance; the locusts gained the ascendency, and the people, who only viewed the present, regretted the loss of the grackles. In a few years afterwards a few pairs were again introduced. Their preservation and breeding were made a state affair; the laws held out protection to them, and the physicians, on their part, declared their flesh to be unwholsome. The grackles accordingly multiplied, and the locusts were destroyed."

Another interesting family of birds is the corvidæ, in which are included our crows, jays, &c. In many sections these birds are protected, while in more others they are very unpopular. They undoubtedly are very beneficial in destroying great numbers of caterpillars and injurious grubs, but I must confess that the injury they do by killing young birds in the nest, and devouring every egg they can find, nearly, if not quite, counterbalances the good. I have been, hitherto, the champion of both crows and jays, but when I find that a good proportion of their food in the breeding season consists of young birds, my faith in them is considerably shaken.

I had often noticed the skulking habits of the blue jay in the orchards and pastures in the breeding season; I seldom heard his note, but every time that I discovered him he was silently flitting through the foliage, apparently searching for something that he was afraid would hear him.

On following him, he almost invariably attacked a bird on her nest, (one of the species smaller than himself,) drove her from her brood and killed them. Now each of those birds would, in the course of the year, probably, kill as many insects as himself, and it does not require any great skill in mathematics to discover that if he destroys, on an average, ten of these birds daily, through the breeding season, he inflicts on agriculture an injury that he could not, for the whole remainder of the year, remedy. I do not advise the killing of any birds except the hawks, but I cannot, certainly, recommend the jays to the mercy of the farmer.

The others of the land birds are not particularly interesting to the agriculturist, although the quails and partridges that roam over our fields in small flocks destroy great numbers of insects, and what is still better, the seeds of many noxious weeds. A quail prefers the seeds of the common wormwood to Indian corn, and I have killed them with their crops distended almost to bursting with these seeds. When we reflect that the bird is possessed with a gizzard strong enough to completely destroy the germ of the seeds, we perceive at once his immense utility on the farm.

I have endeavored, in this brief paper, to present the peculiarities of some of our familiar birds in as favorable light as I could, to an agricultural audience. Our birds are not generally well appreciated, nor valued according to their deserts. Even in Europe, where for ages the scientific labors of multitudes of her best men have, until very lately, failed to secure protection for the small birds, and even now, we occasionally read of the great shooting matches in various localities in which thousands of small birds are sacrificed. But in this country, where the minor details of agricultural economy have been lost sight of in the pursuit of the greater interests, perhaps because they were not appreciated, the importance of agricultural ornithology has not been felt.

I had intended to give some account of some of the observations that have been made in Europe concerning this interesting subject, but shall have time for but a brief notice of some of the experiments and observations that have been made to ascertain the utility of some of their familiar birds.

In a green-house three full-grown rose bushes were covered by about two thousand of the aphis or plant louse, a titmouse was introduced and allowed to roam about at freedom, and in the space of a few hours the whole multitude of insects were consumed, and the plants thoroughly cleansed.

During the year 1848 an enormous quantity of the *bombyx dispar*, a well known enemy of their gardens and forests, had devoured the foliage of the trees which, in some localities, were quite bare. In the autumn, millions of their eggs were discovered, enveloped in a silky sort of covering, and attached to the trunks and branches. Many were removed; but the hand of man was powerless to work off the infliction, and the owners of the trees resigned themselves to their loss. But on the approach of winter the titmice and wrens paid daily visits to the affected trees, and before spring had arrived the eggs of the insects were entirely destroyed. A hungry redstart captured in a room, in the space of one hour, six hundred flies. If this little bird hunts but for two or three hours a day at this rate, we can see the immense amount of good it does.

"Frederick the Great, King of Prussia, being very fond of cherries, one day ordered a general crusade against the sparrow tribe, some of them having ventured to pick at his favorite fruit. A price of six pfennings a brace were set on them consequently throughout Prussia. The war was briskly carried on, and so successfully, that at the end of two years, not only were cherries wanting, but most other fruits. The trees were covered with caterpillars, and completely stripped of leaves; insects had increased to an alarming extent, for other birds had been frightened away by the extraordinary measures taken against the sparrows. The great king was obliged to confess to himself that he had not the power to alter that which had been ordained by a still greater King than he, and that all attempts at violence and wrong were sooner or later avenged. He retracted his decree, and was even obliged, at a considerable expense, to import sparrows from afar, for these being birds of obstinately sedentary habits, would never have returned of their own accord."

In 1847 an immense forest in Pomerania was on the brink of being utterly ruined by the havoc of caterpillars. It was suddenly and very unexpectedly saved by a band of cuckoos, who, though on the point of migrating, established themselves in the place for a few weeks, and so thoroughly cleansed each tree that the following year neither depredators nor depredations were to be seen. The cuckoo, like the smaller insect eaters, eats all the day long, for the caterpillar is full of juices, and contains but little solid nutriment. By careful observation it has been ascertained that the cuckoo devours one caterpillar every five minutes. If we assume that one-half of the destroyed insects are females, and that each female contains about five hundred eggs, one single cuckoo daily prevents the reproduction of forty-two thousand five hundred destructive caterpillars.

Thousands of these instances might be given of the great facts that have been ascertained in Europe concerning the utility of birds, but my space will not permit a longer discussion of the subject. In conclusion, I would say, that thanks to the present existing law, protection is secured for most of the valuable birds in the State; but unfortunately, in some localities, the law is totally disregarded, and attempts are made annually to have it repealed by the legislature. That such a repeal would be injudicious I think there is no necessity for my remarking here; but I would respectfully suggest to the gentlemen present that no opportunity should be lost to discourage such legislative action, and also to extend individually that protection and encouragement to these their best friends, that their labors and associations most certainly merit.

On motion of Mr. STEDMAN, of Chicopee, a unanimous vote of thanks was tendered to Mr. Samuels for his very instructive and entertaining address.

SHEEP-HUSBANDRY.

The PRESIDENT.—In accordance with the programme laid down this morning, the subject matter now before the Board is *Sheep-Husbandry.* I suppose every Massachusetts farmer will admit that this is a very important subject. I cannot speak upon this subject from personal observation or experience as a sheep-raiser, but I know there are gentlemen here who have followed the business of sheep-raising for years, and who are the owners of excellent flocks, and can give us information of importance on this subject.

There are various questions of importance to be considered by every one. First, are sheep as good a stock for me to raise, whether my farm be in Berkshire or any other part of the State, as neat stock?—upon the hills or in the valleys? And this may be considered in two points of view. First, which is best for my farm? This is an important consideration, to have stock best adapted to the improvement of the farm. The next is as to the profit. Then comes up the question as to the various breeds of sheep. Shall they be short-woolled or long-woolled, Merinos, Cotswolds or Southdowns? Shall we grade for the mutton or for the wool? Having thrown out these hints, I desire to leave the subject for gentlemen to proceed with the discussion.

Mr. THOMPSON, of Nantucket, requested permission to read the report of Edward M. Gardner, chairman of the committee on sheep at the last county agricultural fair in Nantucket. It was as follows:

SHEEP RAISING.

Upon no subject is there such a conflict of opinion. Whether sheep are profitable or unprofitable; whether they injure or improve lands; whether fine or coarse, large or small, are most productive, are questions of often discussion and entire disagreement among farmers.

Much of this conflict of opinion arises from an imperfect knowledge of all the facts. Certain kinds will flourish in some places, and others not. Some lands will be improved and others not. Sometimes coarse sheep are most desirable, and again the finer breeds; so that a farmer must look at all his surroundings before he can decide. To be candid, your Committee have not a high opinion of sheep raising at all, as usually carried on in this county. Any land that will produce any other crop, will yield more with the same care and capital than it will in sheep raising. And yet we believe in every farmer having a few sheep. A flock of a hundred sheep would tear an ordinary farm of twenty or thirty acres all to pieces. Fifteen or twenty would be not only beneficial to the land, if pastured judiciously, but of pecuniary profit to the owner.

Every farmer needs a few sheep on his farm, as scavengers. They are indiscriminate feeders. They are continually shifting from one species of herbage to another. Our soil is peculiarly favorable to sheep. It gives them a rugged constitution and strong muscular development. Sheep, too, are powerful digesters. They can extract from the driest and coarsest herbage, more nutriment than any other animal. They therefore consume, in proportion to their weight, a larger amount in bulk.

Linnæus found that by offering fresh plants of the ordinary feeding kind, that horses ate 276 species, and refused 212; cattle 268, and refused 218; while sheep ate 387, and refused only 141. So that when you have pastures over which your milch cows have grazed, and you find the briar, the indigo, the fern, and the young whortleberry remaining, then a few sheep to follow on behind your herd will be a profit. Where ten cows and twenty sheep would united produce a good profit to you, a hundred sheep, without any cows, would make you poorer every year. The twenty sheep, thus managed, would really improve every lot, while the hundred would utterly destroy your whole farm. It is over-stocking and injudicious feeding, and the loss by trampling and the gnawing of half-fed sheep, that destroy the farm.

And so some conclude that sheep injure land, and by their manner of feeding they do; while others as confidently assert that they are a benefit: and so they are, as they use them. We repeat, then, that every farmer should keep a few sheep. They will clean up his rough pastures. They will furnish some lambs for his table and some for market. They will produce wool enough to make warm the wearing apparel of his wife and daughters, to quilt also into the coverlets for winter, to make his yarn for stockings, and a balance to sell for cash to help pay his tax. So far they are good on our farms, but no farther.

On the Western prairies, where a man has acres on acres more than he can cultivate, a large flock of sheep will bring him a good return. In fact, all that he gets from them is clear gain. So among the Granite Hills, where rocks and boulders, and abrupt sides make land unfit for meadow or tillage, there sheep in large numbers will be profitable. Not so with us. There was a time when sheep raising was worth pursuing in Nantucket. When the flocks could wander over fifteen thousand acres of tolerable pasture, worth to the owners a mere song; before malice and all uncharitableness had swept the commons through that " dog-in-the-manger spirit " which is at times found among bad men ; before brother had commenced war on brother, and the spirit of Cain had begun a warfare on our flocks, then the fifteen thousand acres would feed their *fifteen thousand* sheep (*only then one sheep to an acre*,) and what return was made was a clear profit.

Well now, if we come to the conclusion that we should keep a few sheep, the question arises as to what kinds. As with cows, so with sheep; no farmer can afford to keep any kind but the best. That is, best for the farmer, looking at all sides of the account. Once, the flesh of sheep was a secondary matter. Wool was the leading element. Within twenty years thousands of sheep have been slaughtered for little more than the value of their pelts. Merinos and Saxonies were then the rage. But mutton is now of value. Therefore the farmer should now look for a kind of sheep that would produce the most value, taking wool and mutton both into the account. The sheep best fitted for our soil and climate and for profit is the Southdown. No sheep now commonly reared, will produce upon a given quantity of feed so much wool, so good wool, so much mutton, so good mutton, so many lambs and so hardy lambs as the Southdown. The sooner you get these pure, the better for the purse. The Southdown sheep and Ayrshire cow are the farmer's handmaidens. The Merinos are too tender, and the carcase almost worthless. The Cotswolds are too coarse both in wool and mutton, and so are the Leicesters. Five Leicesters or six Merinos eat about as much as a cow, and as much as eight or nine Southdowns. The Southdown, for flavor of the mutton, is far ahead of any other known variety.

When you have procured the best sheep, it then becomes necessary to take care of them. While you get clear of the diseases and dangers incident to large flocks, still there is care necessary. They should be fed and sheltered in the winter. They should have protection from the rains and heat of summer. Rain is the great destroyer of sheep. In clear, dry, cold weather, the tenderest one will in no way be injured. With the thermometer at zero, the sheep is comfortable and happy, while on a drizzly, warm day, or in a rainstorm, in either winter or summer, the sheep is a great sufferer. The reason is obvious. The temperature of the body of a sheep is higher than that of any other domestic animal. It is usually in healthy sheep about 104° above zero, as marked on our common thermometer. Nothing tends to lower this temperature so readily as the saturation of the fleece by wet. And as the temperature is lowered, so he sinks in condition. It requires all that he can eat to furnish sufficient carbon or heat to expel the cold from his system. Nothing is left for nourishment, and so the damp weather actually produces starvation. Clear weather, and the colder the better, we may almost say, is the sheep's holiday. His casing of wool is sufficient protection. But a continued rainstorm is the messenger of disease and death. Therefore, we close with recommending our farmers to keep sheep; to keep but few; to change often their pastures; to let them follow on behind their cows to clear up their pasture land; to keep Southdowns; to keep them well fed; to shelter them in wet weather, and in winter, or when there is dew in summer, to see that they can get water; and further, to remember one thing, that 45 pounds of pease or beans are equal, for feeding them, to 100 pounds of best hay, and equal to 504 pounds of turnips or 276 pounds of carrots.

Mr. SMITH, of Middlefield, being called upon, said he preferred that gentlemen should ask him questions on any points with regard to which they desire information.

Mr. STEDMAN, referring to a statement in the report read, that there *was a time* when sheep could be raised at a profit, inquired if there ever was a time when they could be raised at a greater profit than now.

Mr. SMITH.—I think not. In my opinion, where you can raise beef, and make butter and cheese,—those heavy articles,—

you can raise wool with a profit. Where you can go into gardening, I don't think you can. My experience is, that in our part of the State, where we raise the heavy articles I have mentioned, it is profitable. I think, so far as dollars are concerned, it is more profitable, one year with another, than raising beef.

Mr. STEDMAN.—What is the average price of pasture land?

Mr. SMITH.—I have known some bought for two dollars, and it is not often as high as twenty-five dollars an acre.

Mr. KEITH.—How much can a man afford to pay for his land, and devote it exclusively to sheep, and not sell his sheep for over ten dollars apiece?

Mr. SMITH.—I think just about as much as you would if you were to raise beef, and make butter and cheese. I could not exactly determine. I think you can pay for a farm as quick by keeping Merino sheep as anything. I have no sheep for mutton, and never kept them for that. If I were to go into raising mutton sheep I should take the Southdowns. A few of them would pay on most farms, where you have other cattle. But I doubt whether any man can make much profit by stocking his farm for mutton. You cannot get sheep very fat where you have a large herd; where you keep a few you can. Their being fat increases the value per pound. For an extra quality of mutton, the Merino is not the best. It is impossible for an animal to be very fat and grow fine wool at the same time; no animal can give fifteen or twenty pounds of wool and be enormously fat, any more than a cow can give a great amount of milk and be very fat.

I think the Merinos will pay the best. I have never seen a large flock of one or two hundred that a man ever made money on, for mutton; I have known many sink money on them. There is no sheep that will do so well in large herds as the Merinos; and they will not do as well in large flocks as in small ones. But, as they are grown for wool, if they don't get very fat, we get a pretty good supply of wool.

It was stated in the report that was read that the Southdowns produce the most wool. That is not so. Any ordinary flock of Merinos will produce more wool than the same number of Southdowns.

Mr. DAVIS, of Northborough.—What does your flock shear?

Mr. Smith.—A good flock, washed in cold water before shearing, will average four and a half or five pounds—that is, really fine wool. There are those that will shear six, eight or ten pounds; but I hardly think I know a whole flock that will shear over six. The extremely heavy weights that are reported—twenty pounds and so on—are unwashed fleeces.

Mr. Davis.—Can you get six pounds from pure Merino, or are they grades?

Mr. Smith.—Pure Merino. I do not believe in cross-breeding. You don't know what you will get; it will be neither Merino nor Southdown. You injure the quality of the wool, and I think you will not increase the quality of the mutton enough to overbalance it. It is the oily and soft wool of the pure Merino that makes the soft cloth. Our hard hills, as Dr. Loring told us, are the seed-bed of the Merino sheep. They do deteriorate in warmer climates and richer pastures. By taking them West they rather run out in some qualities, though they get a larger growth. They lose the dark coat of the wool. But we can make it profitable to raise sheep to sell West, as they do in Vermont.

Mr. Davis.—Did you commence breeding your flock on new land, or land that had been exhausted by cattle?

Mr. Smith.—It was old land. If I was going to run in debt for a farm, and wished to pay for it as soon as I could, I would keep as many sheep as I could. You can turn off more money with sheep than you can with cattle. But if I wished to keep my farm up, and have a better farm in the end, I would keep cattle.

Mr. Davis.—Can you take your land and fence it, and put sheep in to make them clear the brush quicker than with cattle?

Mr. Smith—Yes. But neither sheep nor cattle will clear out brush properly. Sheep will run out blackberries, and the white daisies, too. That is certain. I have heard much about the white daisies, but I don't care any more about them than I do about white clover. A flock of sheep will clear them out in two years. They will eat them as quick as they will hay. The yellow daisy I do not like so well. I would keep cattle on a field about three years, and then sheep one year. There will a good many things like the daisy, work in, that the sheep will clean up.

Farmers in this section make a great objection to sheep on account of fencing. They do not make any trouble with us. Sheep will adapt themselves to their accustomed places. They will sometimes get over walls; but I would as soon fence against sheep as cattle. My sheep are kept in a pasture where the wall is not more than four and a half feet high. I do not buy and sell. I raise a few, and keep their morals good. Sheep can be taught not to jump. To always have a good fence is the best way.

Col. P. W. Taft, of Worcester.—Is it not rather necessary to have a good pasture, to begin with?

Mr. Smith.—I do not know as it is so. I know one man who always kept the same flock, where his walls are very low, with no poles on them, and the pasture not very good. But we do generally pole our walls; it is very simple and easy.

Col. Taft.—There are some sheep that like to travel.

Mr. Smith.—Get the Merinos, short-legged ones. They are like some short-legged men, who rather sit down than travel. (Laughter.) There is a great difference between them and the spindle-shanked sheep. Sheep prefer to eat where the grass is short, where they have eaten before.

We have taken pains to raise a good quality of sheep, though perhaps not so good as they raise in Vermont. When there is a dry time, and feed becomes short, the flock can be reduced without any detriment; because, if the poorest ones are culled out from a flock of two hundred, and the best breeding ewes are retained, the flock the next year will be nearly as large, and of a better quality. The lambs will be worth nearly as much as those sold, for wool, though not quite so good for mutton.

A Member.—Is it a benefit to a pasture to keep sheep?

Mr. Smith.—I know that in the eastern portion of the State it is thought that sheep benefit a pasture; but in our section the keepers of sheep are of a contrary opinion. A few years ago, when some thought their farms were running out, and sheep were low, they sold off their sheep and went into cattle raising. Almost every one of those men will say he lost money by shifting, and that he could make more money by keeping sheep. But they will say, also, that their farms are better for the change. That is the experience of the farmers on our hills. I know it has been said that sheep leave a great deal of manure, and more evenly; but they leave it more unevenly than horned cattle. They pile it up where they stay every night, and they stay at least one year in pretty much the same spot; and that is generally near the highest point. That is some advantage, for it washes to lower ground. But it often goes off in a heavy shower in channels, where it does not do much good.

Mr. KEITH, of Grafton.—If you wished to raise a good orchard, would you put sheep among young trees?

Mr. SMITH.—No. They will gnaw or bunt off the bark.

Mr. KEITH.—It is a favorite idea in Worcester County, especially in Grafton, that sheep will eat up the wormy apples and do good.

Mr. SMITH.—They will get fat on apples; but I should rather turn hogs in.

Mr. DAVIS, of Northborough.—Did you notice whether, if you raised your ewe lambs that were from sheep producing twins, they were any more likely to produce twins?

Mr. SMITH.—No. I think high feeding is more likely to do it. Merinos do not often produce twins. The Cotswolds are very apt to have twins, and I judge it is from high feeding. I rather have one good lamb than two middling ones. As a general thing, Merino sheep are not milkers, and do not give milk to raise two.

Mr. DAVIS.—How do you protect yourself from dogs?

Mr. SMITH.—We do not often get sheep killed by dogs.

A MEMBER.—Do you apply to the county commissioners?

Mr. SMITH.—I should if my loss had occurred since they were appointed.

Hon. VELOROUS TAFT, of Upton.—I see a gentleman present who used to raise sheep before you and I, Mr. President, were born; and I shall take the liberty to call upon that gentleman to give his experience. If he sees fit to do so, it will be, I think, a great pleasure to the Board. He has done much to improve the agriculture of the county and of the State. I will suggest the name of Ex-Governor Lincoln, and ask him to give some of his views on sheep raising.

EX-GOVERNOR LINCOLN.—I came in here, Mr. President, to take a very humble seat, rather with a view of showing my respect to the object of the association which has convened here, than any other purpose, except it be, in my old age, to get some instruction which I am sure I never obtained in my youth. I am exceedingly gratified that it should have fallen to my lot to be in here a moment, and I owe it to my friend that the suggestion has been made that it was somewhat my duty to speak on this present occasion.

I have had little experience in sheep, other than to obtain some six or seven hundred dollars for an animal when they were more valuable than they are now.

One gentleman has referred to the use of sheep on land where the white daisy grows. My father had land on which he kept some thousands of sheep, and he cleared his out-lands almost entirely by pasturing them with sheep; especially of the large yellow flower, the johnswort. Those who lived at that time will bear me witness that the productiveness of his pasture lands was greatly increased by sheep-husbandry. I recollect perfectly well, that the lands were exceedingly fertilized by the sheep running over them; and it was said that their tails supplied much more than their mouths destroyed.

My own experience was much to that effect. As I intimated, I went into sheep-husbandry at a time when there was a great rage for that branch of business. I procured a valuable sheep from a clergyman of Brookfield, Rev. Mr. Stone. But I left the business when I went to Washington,—not with a loss, but a profit,—and in 1820 I sold two crops of wool for two dollars a pound, to be manufactured in the town of Millbury, in this county. Were it not for the very great cost of land in this neighborhood, and for that everlasting discouragement, the keeping of dogs for the destruction of sheep—for I know of little other purpose for which they are kept—I think it would be good husbandry in all parts of the State. I have no doubt of it. Certainly, they are kept without very great labor, and in that respect, it is a great advantage. At the price which wool now brings I can scarcely conceive that it should not be profitable but for the two causes that I have mentioned,—the great price of lands and the almost entire destruction of some flocks by dogs. This is all the hint that I can suggest that will be of profit.

As to their eradication of weeds, I thought it might be important that I should state what I knew as to their keeping, in my early years. With regard to the great quiet of the animal, I was not so fortunate as the gentleman before me, (Mr. Smith.)

I found they had a great disposition to go from a poor pasture to a good one, and sometimes they would get into the mowing-lot. It was necessary to have large poles on the walls. I recollect that my father had a large pasture in Oakham, of several hundred acres, and that there was a pole on every wall to keep them. I think they could not have been kept without it. At that time it did seem to detract a little from the comfort of keeping them on account of the labor in keeping them within their own limits.

I wish to express my grateful acknowledgments for the kind notice which the gentleman from Upton was pleased to take of me, and an apology for the humble remarks which I have had the honor to offer. (Applause.)

Mr. SMITH.—The Spanish Merino sheep are much more quiet than the sheep we formerly kept.

Mr. STEDMAN being called on, said: I suggested to my friend, Mr. Perkins, that when he and Mr. Smith had got through, I had about six months' experience to relate. I was not in the habit of keeping sheep till last year. About a year ago I purchased six, which I wintered very carefully and satisfactorily. They brought me six lambs about the first of April, within a few days of each other. The last of June I sold a part of the lambs and one or two of the old sheep. The results in that case were very satisfactory. I kept the sheep up during the whole season. They had a place under my barn where they ran, and were fed with dry fodder till I could procure green, and then fed with grass. The sheep fattened with the lambs, and the lambs, less than three months old, and without any extra keeping, brought me about six and a half dollars each. They were a mixed breed, mostly Merino, with some Cotswold. The lambs weighed sixty-two to sixty-five pounds, live weight. The sheep weighed about one hundred to one hundred and ten. I sold the lambs at ten cents a pound, the sheep at six,—what I sold.

I was so well satisfied with my experience with that flock that this fall I purchased about thirty ewes that I design to keep in the same manner—let them bring in lambs and be killed off next year. I also bought about seventy-five wethers that I am feeding. I feed, in part, rowen hay, and in part, the poorest hay I have, and some corn. I feed in racks suitable for hay or corn.

Mr. Perkins inquired as to the value of the manure from sheep.

Mr. Stedman.—I have not had experience enough to judge. I can see no reason why the same quantity of food given to sheep will not produce an equal value of manure, unless they extract more nutriment from it; and if that is so, I should get more wool or mutton. Another thing I save,—the toll for grinding my corn. If I carry my corn to the mill to be ground for my cattle, it costs nearly one-tenth. My opinion is that in the hilly pastures there is no stock that can be better kept than sheep. If I can keep them in a place where I am obliged to keep them shut up, they can be better kept here. I shall keep my sheep that I have now, in the same way that I did last year.

But in this day, considering the high price of meats, we are not to leave out of our calculation the carcase. The mutton is worth, with us, from twelve to fifteen cents per pound. I have got fifteen cents in State Street, in Springfield, for a few.

A Member.—How much grain do you give your wethers?

Mr. Stedman.—I begin with a pint a day. I use corn unground.

Mr. Smith, of Sunderland, being requested to give his experience said:—I do not know that I can give any instruction on this subject to members of this Board. All haye seen more years and had more experience than I. From my youth up I have been accustomed to stall feeding both cattle and sheep. For several years past we have been in the habit of purchasing sheep in the fall and fattening them through the winter, and sending to market whenever we thought it paid best. I need not say anything, I think, with regard to the way. Sheep take their food as cattle do. They are very good digesters; they make the best of manure, and a great deal of it. If the fold is well supplied with soil and well littered, all the manure may be saved.

I have kept a few ewes for breeding; the best and largest ewes I could find; young sheep, from two to four years old. I prefer the Southdowns. The buck is put in the first of August. The earlier we can get the lambs the better. I like to have mine come in in January or the last of December. The sale of the lambs is the main object in keeping these ewes. The wool is a secondary matter. The wool of the Southdowns is a good article, and the lambs are good; for that reason we prefer them. I sold my lambs last season, for the early market, at eleven dollars a head. I suppose some men who have money enough can afford to have them, but they would be rather dear eating for me. I keep the lambs till they are about four months old. The drover usually takes them about the last of April or the first of May, and so on through June. Mine have always gone off by about the first of July. I keep my ewes up till that time. While the lambs are suckling, the sheep is increasing in weight also, and can be turned off for mutton if we are disposed to do it; and we make three prices,—on the wool, the carcase of the sheep, and the lamb. I have sold the old sheep for six cents a pound when the meat was not worth so much as now. The old sheep would weigh, alive, as high as one hundred and fifty pounds. But this is not all profit, for the sheep requires the best of feed. We prefer rowen, and make it our practice to save this for the time when we wish the greatest amount of milk. The lambs have a pen into which the mothers cannot go, and before them is a box of meal to which they can go at all times. I have had some that would weigh nearly a hundred pounds at four months old. They will take a quart of meal a day sometimes. I have fed to much advantage on cotton-seed or linseed meal. A mixture of cotton-seed meal, linseed meal and oats is better, with some rye also. Some farmers feed rye to advantage. In Shelburne and Conway it has been the practice to use rye.

Mr. Perkins, of Becket.—What is your opinion of the relative profit of keeping sheep and cattle?

Mr. Smith.—I think there is more profit, on the whole, in keeping sheep. For the last few years, perhaps, cattle have been more profitable. It is very pretty business to feed sheep. Lambs will bear grain full as well as yearling sheep. They do not eat so much, and bring more by the pound after being fed, because they have a greater amount of wool in proportion to the cost. Last season I sent to the early market thirty-six lambs from fifty ewes. It takes sheep about two years to get into the way of having early lambs. I have heard it said that sheep will take the ram a month earlier each year, which I believe is true.

Mr. Stedman.—There is one fact which I will state that was related to me by a neighbor of mine, who feeds for mutton.

He said he put up a hundred sheep last fall to fatten, and fed seventy bushels of corn, exactly; and when that was gone, with what hay they had eaten during the time, he realized an advance of four hundred dollars on the hundred sheep.

Mr. SMITH, of Sunderland, said he had to build high fences to keep his sheep.

Mr. HUBBARD.—I have always kept a small flock, and at a small profit. I disposed of them because they had not been so well taught but that they would go beyond my limits. I had my lambs come early,—about the first of February,—and by the time they were four or five weeks old they had a separate pen where they could go beyond the sheep and be fed with meal, up to nearly the time they were ready for market. I could always get them to bring from one to two dollars more than they would if not so well taken care of. I feed with linseed meal, corn meal, and oats, mixed together. They were always taken in at night, and when the weather was stormy. A few years ago, when prices ruled about half what they do now, I sold the lot together for five dollars each. A fair average price was three dollars for common lambs. I do not think it best for us who keep small flocks to go into fancy stocks. My object is to keep good-sized sheep and take good care of them, and keep them more for the lambs than the wool; the wool, I think, is a secondary object. The West can raise sheep for wool better than we can. We can get almost as many lambs as there are sheep, as there will be some twin lambs.

A MEMBER.—Did you not lose lambs from the cold?

Mr. HUBBARD.—Very seldom. They were housed in the barn. I used to cut down the hay to the bottom of the bay; and when the sheep came in I admitted the lambs into that part of the barn. I could get lambs the first of February that would weigh eighty pounds by the first of June. They weighed all the way from fifty to eighty pounds.

On motion of Mr. STEDMAN it was voted that an opportunity be given to Mr. Capen, of Boston, to present his views on Meteorology at the opening of the session to-morrow morning.

Mr. STEDMAN.—In the notice sent to us, as members of the Board, respecting this meeting, we were each requested to prepare an essay concerning the agricultural interest of our respective districts. In my own case, the notice reached me so late that I did not have time to prepare one, as I had only a week, and that the week of Thanksgiving. I like the suggestion exceedingly, and think it proper that the members should prepare such essays, and present them. I have, therefore, prepared a Resolution on the subject, which I beg leave to offer.

Mr. KEITH, of Grafton, seconded the Resolution, which was adopted, as follows:

Resolved, That each member of the Board be requested to present, at the meeting of the Board in January, an essay upon the agriculture of his particular district, giving, so far as practicable, the number and variety of thoroughbred stock, principal crops, manner of cultivation, markets and other topics, including details of individual practice, so far as they may be of general interest.

Adjourned till 7 1-2, P. M.

EVENING SESSION.

The evening session was devoted to a lecture on the

ADAPTATION OF PLANTS TO THE WORLD, TO SOIL, CLIMATE, ETC.

BY HON. PAUL A. CHADBOURNE.

In my discussion last evening, I endeavored to enforce the idea that study is not only essential to the highest success of agriculture, but that farming ought to rank among the learned professions as a field of intellectual labor and enjoyment. It is beautifully adapted to the wants of man. The general laws of vegetable growth are so simple that they can be understood by men in a low state of civilization, when their wants are few; and they are also so complicated and nicely balanced in their higher relations, that they require all the study, wisdom and skill of the highest civilized society, that the fruits of the earth may satisfy, in their quantity and quality, the demands of such a state of society. We find, then, in the very beginning, plants adapted to man as an intellectual and physical being. By their unlimited power of improvement they are fitted to call out forever his mental activity, and by this very power of improvement they are fitted to gratify his increasing desires as he advances in civilization.

But I propose to consider to-night the provisions which nature has made for clothing this earth with vegetation, and so adjusting plants to the world that they can keep their place in it. In the study of this subject, I have been struck with wonder and admiration at the complexity and yet the perfection of the machinery. The whole world is full of springs, and valves, and self-regulating adjustments, any one of which ceasing to act, every living thing would perish and the earth become a waste. It is not strange to me that some men, in the glimmering of scientific light, have considered the earth a living thing. Its adjustments and provisions are so perfect for the support of vegetation upon its surface, that it seems like the animal system, secreting and throwing out in every place just the materials needed to carry on the vital processes. Nearly seventy elements are now known. They make up the air, the waters and the solid ground. Many of them are so small in quantity that we do not know their use. About twenty of them make up the great mass of the earth's crust and the organic beings upon it. Now, if one of these abundant elements were blotted out, or essentially changed in its quantity, its nature or its distribution, life would be impossible upon the globe. We speak of such beings as now inhabit it. I will take, for illustration, some of the elements that are generally considered of secondary importance in organic beings. Take potash as an example. None of our higher forms of vegetation can exist where this substance is wanting in the soil. Suppose this substance were unknown upon the globe, or confined to limited localities, what a change would pass over the whole face of nature. Or take *phosphorus.* We think of it as a rare substance, and I suppose most people think the worst that would happen to us, if this were swept out of existence, would be the loss of friction matches. But every grass, and grain, and fruit-tree must find phosphorus in the soil or they cannot grow and ripen their seeds. If phosphorus were gone, or essentially changed from what it is, the earth would become a waste, for the higher forms of vegetation would be impossible, and the higher forms of animal life unknown. Man could not exist upon the globe, for bone and brains must both have this element in their composition.

But there are four elements—oxygen, hydrogen, nitrogen and carbon, that are the pillars of all organic structures.

If there were no oxygen, the globe would be mainly a metallic ball, mingled with silicon. The rocks, the sand, the clay-beds and the soils, would be impossible, for oxygen makes up one-half the crust of the earth. Without this element there could be no soils, no plants and no animal life; for it not only enters into the composition of animals and plants, but in the atmosphere it offers the only condition of animal life. All must breathe, and breathe oxygen, or they die.

Without hydrogen, the second element, there would be no water upon the globe. The oxygen might form the oxides as it now does, but if there were no hydrogen the earth must forever remain a barren rock. Water is the great geologic agent in preparing the earth for vegetation, as well as in sustaining life. And so I might go on to enumerate one element after another, and show that if it were gone, or essentially changed in quantity or property, the earth would be a dreary waste, unless it were supplied with plants and animals entirely unlike those that now exist upon the globe. When we consider the number of these elements, and the great variety among them, how wonderful it is that in the great world-making experiment, such a multitude of conditions should have united to fit the earth for life! The number of adjustments are without limit. The elements are adjusted to each other in their quantity and chemical power so that they can carry on the vital processes in both plants and animals, and then in every living being we find a series of adjustments, mechanical, chemical and vital, by which each one is fitted for a particular place in the universe.

The subject is absolutely without limit, and everything that has to do with the conditions of life upon the globe is of interest and practical importance to us. The complex machinery of earth, water and air with which the farmer has to do, far surpasses the most complicated and perfect work of man. The farmer ought to enter into these secrets of nature, that he may not be a mere operative, doing so much work by the aid of this machinery; but he should so understand it that he may use it aright, always to the best advantage, and be ever ready to avail himself of those hints which nature is ever making to those who understand her processes and look to her for instruction.

I shall only have time to speak of a few of the adjustments by which plants are fitted to their place in the world, by which they are related to the inorganic world, to the animal kingdom and to man.

I cannot omit to notice the fact, that the four elements that make up the mass of organic beings are everywhere diffused in the atmosphere.

The riches are above us; but the plants cannot take in riches from the air, unless they find what they need in the soil to form ash. They are like sick men at richly furnished tables—they need a tonic, a stimulant.

The first relation of plants that demands our attention is to the earth and air. It is from both of these that the majority of plants draw their support. The root, as though loving darkness, plunges into the earth; the branch with its leaves seeks the light. This polarity of the tree is striking, appearing as soon as the germ begins to develop. Both branch and root are formed from cells of originally the same nature, for under proper conditions the root may put forth buds and leaves, while the branches, under the influence of darkness and moisture, develop roots. But the welfare of the tree demands that there should be this polarity, and here we find it, a portion plunging into the earth to keep the plant in position, and furnish it with those salts from the earth needed for its growth, and the opposite portion just as plainly seeking the sun, light and air, having a structure just fitted for its work. The root divides and subdivides, stretching far through the soil, gathering in its richness, and the leaves give increased surface for sweeping the gases from the air, and for preparing the crude materials for the use of the plant. All the varied forms of leaves are such as to favor radiation, and thus to condense the dews upon them. The delicate but firm woody framework, like the vessel's spars, keeps the soft tissues stretched in place, that abundant surface can be secured with light weight. We cannot but admire that provision by which all wide-leaved trees in the northern zone, where snow and ice abound, are prepared for the winter. Their leaves appear as by magic in the spring, but the stem of every leaf has its curious joint, so that when the summer is past and the leaf becomes ripe or is killed by the frost, it drops from the tree, and naked branches alone are exposed to the snow and ice and winds of winter. Further south, wideleaved trees are evergreen, but were they so in northern climes, with their present structure, the species would be destroyed. One single winter would ruin our elms and maples and kindred trees, if their leaves remained upon them. Their trunks divide into large branches, that in some old trees break down by their own weight; and these large branches, if loaded with snow and ice, would be torn from them by the winds, and decay and death would follow. But our northern evergreens, the spruces, the firs, and pines, were made to endure the frosts and snows without danger. Their whole plan of structure is different from that of the broad-leaved trees. Their trunks rise a single shaft, never divided except by accident. Their limbs are disposed in circles; they are small compared with the size of the trees. They are not subdivisions of the trunk, but are fastened into it as pins are driven into posts. The well arranged, bending limbs remind one at once of a well-formed roof from which the snow easily slides. Even when the ice gathers upon them they are with the greatest difficulty broken from the trunk, and if broken, their structure is such that no harm is done to the main shaft. Here, then, we have all wide-leaved trees, like prudent mariners, furling their sails when the dangers of winter approach, thus presenting only bare poles to the wind, while cone-bearing trees, as though conscious of the strength of their spars, keep every stitch of canvass spread, and bid defiance to the storm.

Did the elm form the joint to its leaf, and determine the time for it to do its appointed work before the frosts and snow? Did the pine and spruce find, by experience, how their limbs must be fastened to the trunk, and that the trunk must be kept solid and entire, a single shaft? Did any force in nature establish these relationships by which the tree is not only fitted to the earth and air, but to the dangers of particular zones?

The position of the bud is also worthy of attention. Every plant has a specific form, and this form is due mainly to the position of the buds upon the stem. They appear in exact relation to each other, which, in each species, can always be represented by a fixed mathematical expression. Since buds represent leaves, and flowers and branches, not only the symmetry, but the welfare of the tree demands that there should be some definite order or plan in their distribution. Were it not so, leaves might be crowded together on some branches and scattered far apart on others; and the same would be true of the branches on the trunk. By this mathematical arrangement of branches and leaves, the beauty of the tree is secured ; it has greater strength, and the leaves are best distributed for contact with the air. When the tree is injured or diseased, it sometimes puts forth buds without order ; but we see at once that they mar the beauty of the tree, and that the power by which it builds up a symmetrical whole has been overcome; for such branches never grow in any fixed relation to the parent stock. They grow like independent plants, while every branch that grows from the appointed place, at once bends itself in obedience to the parent tree.

A second matter of interest is the variety of habit in plants, by which they are fitted to so much of the surface of the earth. There are but few places where vegetation of some kind can not be found. The variety of structure and of habit by which this is secured is certainly worthy of an intelligent and wise Creator. Not only does every zone have its vegetation, but every variety of soil has its own peculiar plants. The various trees may mingle together to form a forest, but the willows line the borders of streams, bind the banks together, and bathe their thirsty roots in the water. The grasses weave their carpets in the meadows, the dry and wet lands having very different kinds, which always find their own place without the aid of man. The humble lichen adorns the unyielding rock and the trunks of aged trees. The fragrant lily lays its long roots beneath the water, and floats its leaf and flower upon its surface. Some plants cluster near the ocean, and others fasten upon the rocks where its waves can wash them, and others still plunge deeper down, and form gardens and groves beneath the waters. The feathery palm finds its home in the torrid zone ; the hoary creeping willow steals along beneath the snow towards the icy pole. Thus the earth is covered with vegetation, and in the vast scale of adaptations presented by the multitudes of species, every zone and every soil is provided for.

Not only are these plants fitted for every zone and every soil, but they are also fitted to our place in the solar system. There is a direct relation between the cycle of growth in ordinary plants and the length of the year. The different zones have indeed seasons of very different lengths, but their plants either cannot grow in other zones at all, or if they do, they as a general thing still require the whole year, as they did in their own locality. There is for each species a proper season for the germination of the seed, or for the unfolding of buds already formed, a time for growth, and a time for maturing seeds or buds for the succeeding year. There is indeed great power of adaptation, especially among cultivated plants, so that they are subservient to the artificial conditions that man can bring to bear upon them. But even under the artificial conditions of the hot-house they have their cycle of growth. Such plants of the torrid zone as seem to have little annual change, show their adaptation by their power to endure the climate of that region. But after all the exceptions that can be pointed out, not one can be mentioned that militates against the statement that the plants upon the earth are adjusted in their changes and growth to our distance from the sun and our movement through the heavens. The unfolding leaf, the bundles of fibres in the trunk, and the maturing buds and fruits, all know their time by the earth's position among the stars.

How strange it is, that the early frosts have power to kill the full-grown leaf on our fruit and forest trees, but not even the icy fierceness of winter's cold can harm the young and tender leaf and flower folded in the bud. They have not yet done their work, and therefore they are preserved. But what explanation can be given as to how it is done? They are carefully packed and protected, indeed, and this has been regarded as an evidence of design; but the whole bud is exposed and frozen in spite of its skilful structure. The mature leaf, though protected with ten times the care, could not withstand the cold to which the bud is exposed. Is that power in the young leaf, which withstands the frost, any less wonderful than the structure of the leaf or bud? Is it any satisfactory explanation to call it natural, the nature of the bud? How came the bud by this nature? If we were left to reason upon the subject, we should infer that the tender, unexpanded leaf would be the first to feel the blight of winter. By what process of development was this strange power given to the bud—this unexpected superiority over the full-grown leaf? Is any other account so reasonable as to suppose this power was given by a wise Creator, who understood the conditions of the globe, and gave to the plants, to the leaf and bud, the exact power they needed to meet those conditions?

The same peculiar power possessed by the bud belongs to certain fruits. The young acorns on some of our oaks, which require two years to mature their fruit, and the apparently tender seeds of the witch-hazel, defy the coldest winters. In fact, whatever part of the plant is required to live over from one season to the next, has this peculiar power of withstanding cold, although it may appear the tenderest portion of the whole structure.

In most of the cases thus far mentioned the relationship of the plant arises from what is ordinarily termed the nature of the organs, but the action of these organs is also important. Many of the results produced by the functions of organs are so specific and so well understood that they present strong analogies to certain acts of animals, under the guidance of instinct or intelligence. The loss of the leaf already alluded to might, perhaps, be reckoned among the instinct-like provisions which the tree makes for its preservation, but in this case it more resembles certain organic changes in animals in which they are mostly passive, as in the shedding of the winter coat in spring. The animal has no power to produce this change, though he may be indirectly an actor. The snake could never slip out of his skin, nor the lobster from its shell, nor the ox remove his coat, if there had not been a provision in the organization and function of each for a periodical loosening of the scales and shell and hair.

But as in the animal certain provisions are made by instinct for its own welfare and that of its young, so in plants we find analogous provisions made, as though they were sentient beings.

Some provisions made for the maturing protection and early growth of buds and seeds are of this nature. The structure of all leaf buds is essentially the same, and in some of our trees they can be examined without difficulty. The delicate leaves all ready formed, are closely packed, sometimes, as in the horse-chestnut, in softest down. These again are covered with closely fitting scales, and these again by a coating of insoluble varnish. Mechanically, the whole contrivance is perfect, and the work most skilfully done. In adapting means to ends, the structure of the bud is not surpassed by any work of man. But that bud is first to put out leaves, and these are the organs for elaborating sap.

How shall the tree stripped of its leaves supply itself with food while pushing out the myriad of new leaves from its buds? Like the instinct-guided bee, it has laid up provisions for this time of need. When it has nearly finished its growth for one year, it makes provision for the year that is to come. In the axil of the leaf the bud is set, which another spring is to unfold in leaves, and elongate into the branch. While this bud is fashioned and set in its place, food is also stored up in the tissues in form of starch and sugar and other organic materials, for the support of that bud while expanding its leaves. The same principle is seen in a more striking manner in some of our cultivated plants. The potato is only a thickened underground stem. Its eyes correspond to the buds upon the common branch, and the store of starch, so nutritious for food, was placed there to develop those eyes into stems at the appointed time. When the potato sprouts in spring, without contact with the earth, the branches feed upon this store of food, gathered for its use. The beet and parsnip, and other kindred plants, produce an abundance of flowers and fruit, but never till the second year. The first year the whole energy of the plant is spent in providing a large succulent root stored with sugar and other organized materials. The second year the whole energy of the plant seems to be spent in producing its abundance of fruit, and now it draws upon the collected stores of the first year, and thus produces results which would be impossible were it compelled to elaborate its food when suddenly needed by its multitudes of flowers and seeds. Other plants are many years, instead of one, in making this provision. The century plant, and others allied to it, in their thick leaves store up vast magazines of materials, that are used with astonishing rapidity, when the time comes for them to send up their stems and produce their fruit. The same process may be observed in many of our perennial herbacious plants, that do much of this curious work beneath the soil. The broad-leaved orchis and the Soloman's seal are examples. They provide a large and vigorous bud, as parent of the next year's plant, and while a portion of the old root decays, the remaining portion is packed with food to send up from that bud now hidden in the soil a vigorous plant in early spring.

These provisions are for the plant itself, and only incidentally for the young plantlet which it is to produce. To see this apparent parental care most fully manifested, we must examine the seed. In it is the germ of the young plant. But that germ has no power, at first, over the earth or the gases of the air. It is shut out mainly from both. For this helpless state a provision has been made. Around the germ, or in some way connected with it, the parent plant garners the food which shall support the germ till large enough to provide for itself. The kernel of grain does not fill till its germ is fertilized, but when that is done, when a centre of life is formed, a new plant is there, then the starch and sugar and oil are furnished by the parent stock for its support. All this action is indeed organic, but it is a perfect adaptation of means to ends. The machinery by which the results are reached is as perfect in its structure and action as it is possible for us to conceive of. This provision is not made in one plant alone, but in some form in all. It is not one kind of material that is provided, but many. The work is not done by one method, but by methods almost numberless, and yet every one of these methods commends itself most fully to our judgment. There is not a single case in the thousands, that we could improve upon for the welfare of the plant. We cannot believe that these diverse methods are the development of some force in nature or organizing principle. We cannot, without doing violence to our own mental constitution, regard these as any other than the provision of an intelligent Creator, whose ways are perfect, whose wisdom and skill are infinite.

Between the animal and plant there is a still more striking series of adaptations than between either of them and the inorganic world. They develop in opposite directions, so that the more perfect the plant and the more perfect the animal, the farther removed they are from each other in their structure and nature. The likeness of one to the other is only of remote analogy. And yet, in their most perfect state, when by their nature they are most widely separated in their organic structure, and in their conditions of life, it is often apparent that they were constructed with direct reference to each other. The first relationship which we notice is the perfect balance which has been established between them in their effect upon the air by their chemical action. Everything thrown off from an animal as waste material is not simply a waste to him, but is either a poison to the air or capable of soon becoming so. The carbonic acid from the lungs and all the excretions formed by the waste of tissues fill the air with deadly poisons. . But upon all the waste materials rejected by the animal system, the plants live. They sweep the carbonic acid from the air by their multitude of leaves, draw it from the soil by a thousand rootlets, and gather up the various organic compounds as they are ready to change to poisons, and in the wonderful laboratory of their leafy tissue, they unlock and re-combine the elements, giving back to us in woody fibre, in starch and sugar, in the nutritious grains and delicious fruits, those very materials which but for them would have generated deadly disease. They then throw back from the leaves the liberated oxygen in that active form known as ozone, in which it is most efficient as a purifyer of the air. Not only do the plants thus stand ready to save animals from the effect of their own poisoning influence upon the air, but they seem to have committed to them the task of protecting animal life from the poisons produced by general decomposition, both by gathering up the poisons, and also by some of them showing by their very presence the existence of poisons, and thus warning intelligent man of his danger.

On the stagnant pool the green film gathers, to many appearing the cause of disease, but in reality the safeguard which nature has prepared; a thin veil, with chemical power, which she has spread over such places to gather up and condense a portion of the poisons, and to be a token of their presence. Around our southern swamps she has hung the long moss in rich festoons upon the trees, and woven the thick barrier of climbers, through both of which much of the air is strained. These plants, then, are more than a sign that poisons are generated there ; they feed upon and destroy them.

In studying these relationships, it soon becomes apparent that the vegetable kingdom is in general subservient to the animal. The lower is made to serve the higher. The plants are directly or indirectly the support of all animal life. No animals, unless it be some of microscopic size, have power to live upon inorganic matter. If they have power to assimilate it at all, they have no power to assimilate a sufficient portion to sustain life.

We have around us an abundance of all the elements upon which we daily live, but we have no power to take them in their common form. If left to ourselves, we must starve in the midst of plenty. The plant feeds upon these elements or their inorganic compounds. Plants are the chemists constantly working for the welfare of the animal kingdom, bringing the elements within their power. If plants were destroyed, animal life would cease. For though carniverous animals may destroy others of the same kind, yet in the end we come back to those animals that live upon the fruits of the earth.

There are some curious adaptations in the functions of certain plants that show the relationship of one kingdom to the other, and this general subserviency of the lower to the higher kingdom. Certain insects sting the oak and other plants to deposit their eggs in their stems or leaves, and then leave them there to be developed. In some cases the young insect simply bores into the wood and forms a dwelling and finds food for himself. The only adaptation in this case seems to be in the fitness of the material in which the egg was deposited by instinct, to supply the wants of the grub while actively providing for himself. But what can be more curious—I might say what more wonderful—than the different kinds of oak-galls, or oak-apples, which are formed by the oak, wherever the egg is deposited. When the egg is placed in its tissues, the oak itself, by the very law of its being, diverts a portion of its material elaborated to enlarge its own trunk or fill its fruit, and forms a curious dwelling-place for the young insect; and not only forms the house but furnishes food. No animal, by instinct, ever fashioned a more curious structure for itself or its young, than the unthinking oak forms for the egg of its insect enemy that has been thrust upon it for protection and support. And these dwelling-places, always built alike on the same kind of tree, and for the same insect, differ according to the kind of insects for which they are built. Other plants present the same phenomenon, and plants entirely unlike botanically. On some of the rose-bushes these insect houses are built and ornamented; until they are almost as beautiful as the opening bud itself. The stalk of the golden-rod forms a large ball, in the centre of which you are sure to find the larval insect housed and provided for, or the empty tenement from which he has escaped to a higher form of life. These are but single examples of the adaptation of plants to the wants of the insect tribe. But every naturalist will recall a great number of kindred cases, in which the plant responds to the instinct of the animal, and completes, even at its own expense of vital force, and sometimes in a most elaborate manner, the machinery which is needed to perfect the work which the instinct of the animal had commenced. What chance should lead those insects to deposit their eggs in the very plants that are so ready to act the part of nurses, and supply by special provision all the wants of the young that come from those eggs? How came these plants of different kinds to respond, in these various ways, so perfectly to the need of their animal foes? We wonder at the provision they make for their own young plantlets; we admire their general adaptation to the wants of the animal kingdom as food and purifiers of the air; but when we see them building, on one unvarying plan, a dwelling-place for the insect young, and storing it with food, we can but recognize a power higher than either insect or plant, the Creator of both, who ordained the laws of their being, who implanted instinct in one, and made the other the willing servant of the higher form of life.

There is a variety of contrivances by which insects fertilize plants. The structure of the flower and that of the bee are often adapted to each other, as much as the key to the lock. The honey is poured out in the flower, which attracts the insect, and in his endeavors to reach the precious fluid he indirectly benefits the plant. We might regard this as a matter of accident were there but a single instance of it, or the same structure for all plants. But when we see thousands of species of plants of varied form, with their parts so arranged as to secure fertilization by the aid of insects, and the drop of honey placed in the flower to attract them, we not only recognize design, but in a provision of such varied nature, the idea of chance is excluded. If no honey is secreted in the flower, then it will be found that means have been provided adequate to produce fertilization without the aid of insects. There may be an abundance of pollen, and such a structure that the wind can do the work, as in the corn and pine, or some special arrangement of the parts of the flower to secure the result. It will be sufficient to mention a few cases from the many, of structure, having reference to the action of bees in the process of fertilization. The cucumber and squash are good examples. These vines produce two kinds of flowers,—the staminate, or those producing the pollen, and the pistillate, or those which produce the fruit. Now for the growth of these fruits it is necessary for the pollen to be transferred from one flower to the other. As the flowers are at considerable distance from each other, and protected from the winds, probably not one case would occur in a hundred flowers, of the transferrence of pollen without the aid of insects. These plants, therefore, would seem defective if we consider their own structure alone. If left to their own action, the species would die out. In the Sandwich Islands, where no bees are found, it is necessary to fertilize the large squashes by the labor of men. Where bees are found the work is completed by them. In each flower upon these vines there is a tiny cup of honey, carefully covered, but the cover so thin, in three places, that the proboscis of the bee pierces it with ease. While gathering the sweets of the staminate flowers he becomes covered with the pollen dust, because the stamens are so placed in the narrow tube of the flower that he cannot steal away the sweets secreted there without loading himself with the fertilizing powder. When now he lights in the pistillate flower, he takes its honey, but in his eagerness, scatters from his wings and body the pollen grains upon the pistil, and thus secures the growth of the fruit. When we examine the structure of these flowers, their relation to the size of the bee, and consider the fact that the honey, of no use directly to the plant, but a draft upon its energies, is ready to attract the bee when the pollen is fit for distribution, we see a provision for the welfare of the flower, of such a nature as to secure the enjoyment of a sentient being. The bee is not only provided for by following his instinct, but the following of his instinct is essential to the welfare of the plant. They were both fashioned with reference to each other. In our pretty spring flower, the bluet or forget-me-not, we find a curious relation of the seed-producing organs. The stamens are always either much longer or much shorter than the pistil. When the bee visits a flower with long stamens, the pollen is attached to the base of the proboscis; when he visits a flower with long pistil this pollen comes in contact with its stigma, and at the same time the middle of his proboscis is becoming covered with the pollen from its short stamens, to fertilize the plants with short pistils. But the most remarkable cases of special adaptation are found among the orchids, which have been so carefully studied and described by Darwin. Many of the species cannot possibly fertilize themselves, and if shut out from insects fail to produce seed. One—the *orchis pyramadalis*—may be taken as a type of many in its special adaptations, by which its structure and functions, the structure and instinct of the insect, are all combined to produce the needed result. The structure of the flower is such that the proboscis must enter in a given direction; this brings it in contact with the packets of pollen, that adhere to it by a viscid fluid, that has the chemical property of rapidly becoming solid. The packets of pollen bend over as they dry, so as to take the exact position they ought to take to strike the stigmas of the next flower. Those stigmas are covered with a viscid fluid to which the grains of pollen adhere, and the work is done. What a complicated arrangement is here, and yet how perfect is the result. First, there is the form of the flower that guides the proboscis aright; second, the position of the pollen packets all ready to be withdrawn; third, the glue by which they are firmly fixed to the proboscis; fourth, their hygromatic action, by which, in drying, they bend just far enough to bring each one in contact with the two stigmas of the next flower the insect visits; and lastly, the glue upon the stigmas sufficiently strong to rupture the packets of pollen, and hold sufficient of it to fertilize the seed.

But the most remarkable constitution of plants, by which they are both fitted to the world and to the wants of man, is in the power of forming varieties. Nature has guarded species with great care, providing for their continuance and general permanence in form. But she has given to some species, perhaps in some measure to all, the power of appearing under distinct forms; and these different forms of the same species we call varieties. It was once considered settled that soil and climate produced varieties. They seem rather to be only the conditions, under the influence of which this tendency to produce varieties is enabled to show its full results. I do not wish, however, to discuss here the distinctions between species and varieties, upon which there are divers opinions among scientific men. The fact of varieties is known to all, and some of its results are well understood; and the fruit-raiser and stock-raiser take advantage of it to improve their products.

This tendency to variation is seen most strongly manifested in those animals and plants most useful to man for their products or for their beauty. It may be said they are useful because they vary, and this is true; but they were first cultivated for their own sake as distinct kinds; when it was found they varied they became more valuable from that fact. Now, by the production of varieties, the useful plants can be cultivated with success and profit over a much greater extent of territory than any one distinct kind could be. What variety of corn could possibly combine in itself such qualities that it should be fitted alike for Canada and Texas, for New England and Illinois? But because the corn produces varieties, kinds can be selected fitted to every State in the Union. The potato is another example. New varieties are originated almost every year—some early, some late—and thus the cultivation of this useful plant is extended over more of the earth than any one kind possibly could be. Need I enumerate our fruit trees and vines, and show how new varieties are produced, fitted to peculiar climates, and gratifying the enlarged desires of civilized man. Nature has given us, in the seeds of these plants, unbounded possibilities. We have the best fruit now known, but in the seeds of the apples, and pears, and grapes that have matured this year, there may be the germ of a better apple, or pear, or grape than we have ever seen. And this shall be true forever. When the fruits are gathered their seeds may give us better kinds—more hardy and more delicious to the taste. How perfectly the nature of these plants is adapted to the nature of man. He is capable of unlimited improvement—so are the plants most useful to man. While there is this uncertainty in the seed of fruits, there is certainty in the bud. To the seed there has been given the power of producing new varieties, and in the bud is found the means of propagating any variety that is desired. We see the same tendency to variation among the plants that are simply ornamental. In some of them, as in the rose and dahlia, their beauty is often increased by doubling; and when the plant is perfectly double it can no longer produce seed. But nature never allows any plant to become so double as to lose the power of producing seed, unless she has provided some other method for its propagation. She will not destroy her own work by its law of growth.

Man was made as the lord of creation. Every living thing was put under his control and given to him for his use. It is his work to study the laws of nature, that he may work with her, for he can never successfully work against her.

The farmer is more dependent upon the forces of nature than any other man. He, of all men, should be the most diligent student of her laws. There is nothing in the earth, nor in the air, nor in the manifestations of life upon the globe, that he cannot turn to good advantage. He may call to his aid every natural science; and when he sees what provisions nature has made in her adaptation for his intellectual and physical nature, he is false to himself, and false to the world, if he mistakes his position, and concludes that his work is one simply of routine and toil.

THURSDAY MORNING.

The meeting was called to order at half past nine o'clock, by the President, and HARRISON GARFIELD, Esq., of Lee, was chosen as the President for the day, who accepted the position with an expression of grateful acknowledgment.

LECTURE ON METEOROLOGY.

Mr. CAPEN, of Boston, agreeably to arrangement, was introduced, he having expressed a wish to present his peculiar views on the subject of meteorology.

Mr. Capen expressed his gratification in being permitted to address the Board on this subject, and promised to announce some startling principles, which, however, he believed he was fully warranted in presenting. He was perfectly satisfied that the theory which he was about to advance was true, and capable of demonstration. In this connection Mr. Capen gave a summary of a certain prediction he had made of the weather for a few days past, and including the present day—claiming that the prediction had been substantially verified. The calculations on which these predictions were based are the same, he said, as are employed for the "Old Farmer's Almanac," and for the determining of eclipses. These formulæ give the combinations of the forces which produce heat and cold; and they are the influences which produce wind. When the moon comes to the meredian after sunrise in the morning, or along in the forenoon, the conditions of the atmosphere are extremely favorable for the action of the sun in the early part of the day, so that it is not common for storms to take place that day. Clouds and rain are produced by cold. The vapor is condensed into cloud, fog, rain and snow, according to the intensity of the cold; and of course, if the conditions of the atmosphere are favorable for the action of the sun in the forenoon, the tendency is to break up the conditions of condensation, because the heat expands the atmosphere.

The question may now arise, Why should the fact that the moon comes to the meridian in the forenoon dry off the storms? Or, why should the action of the sun be more favorable to produce that effect than at any other time? The answer is this: Our atmosphere is material—a subtle, elastic fluid. Being material, it is subject to the laws that govern matter, including, of course, attraction, and a capacity for condensation or expansion. The moon being also material, its attractive power is familiar, and admitted; it is constant and universal. The atmosphere is, therefore, subject to the influence of the moon's attraction. All are familiar with the influence of the moon in causing the tides of the ocean, and know that they can be calculated with perfect accuracy. The tides of the ocean are influenced also by the form of the continents, or solid parts of the earth. But it is not so with the atmosphere. That rises, it may be, hundreds of miles above the surface of the earth, and it can, therefore, ride smoothly over that surface, even over mountains and continents, invariably culminating, like the waters of the ocean, to the moon. This point may be considered settled then, that there is a vast aerial tide, obeying the same laws as the waters of the ocean, but following more closely the attractive power of the moon. A little reflection will enable any one to see what the result must be. If the atmosphere were uniformly, and at all times spread evenly over the surface of the earth, we should have a condition of things entirely different from what we have now. The air being material, and culminating toward the moon, having a convex surface toward the sun, it constitutes or becomes a burning-glass. That must be the result of the facts as we know them to exist. Now when the conditions supposed come together, refraction is inevitable. Under the influence of refraction the heat of the sun is turned out of its course. The heat of the sun comes from empty space into an atmosphere which increases in density from the surface toward the earth, and is refracted as light is refracted when passing from the air into water; which is familiar to all.

The question is, how is this heat of the sun refracted? It is refracted in such a way as to be concentrated upon certain latitudes and longitudes, having a kind of concentration of rays in some particular place, as the burning-glass concentrates heat to a focus. I do not say that there is an actual focus produced by the atmosphere, though there evidently must be one somewhere. However that may be, the heat is concentrated upon certain latitudes and longitudes by passing through the atmosphere thus elevated in a convex form. There must consequently be a withdrawing of heat from other portions of the earth, and the production of cold, which is merely the absence of heat. This is the reason why it is often much colder in latitudes south of us, at a given time, than it is here; and also colder in one place than in another in the same latitude. There is a uniform correspondence between these facts, as they occur, and other facts connected with the position of the sun and moon; and they are all to be explained upon the philosophical principles to which I have called your attention.

When the moon culminates at twelve o'clock, M., the condition of things is favorable for the action of the sun, for it rises on the full tide. In the latitude of Boston there are seldom storms when the moon comes to the meridian between six o'clock and twelve. Sometimes there will be storms when the moon culminates at seven, nine or eleven. This science has been reduced to so great accuracy, that we can calculate within less than two minutes those periods of time, between six in the morning and twelve, when the focal crises will occur; that is, when there will be periods in which the thermometer will rise, and in which, a few moments after, a chill will occur. These principles were illustrated at length.

Mr. Capen closed by a statement of the causes that led him to a study of this subject, and which produced in his mind an unfaltering belief in its importance.

DISCUSSION.—FRUIT CULTURE.

The PRESIDENT.—Gentlemen of the Board of Agriculture, the time has arrived for the discussion of *Fruit Culture*. The importance of the subject, I am satisfied, has never been fully estimated, in all its bearings. The importance of early fruits is enough to occupy all the time that can be given to the whole subject. Considering the great variety of soil and climate that we have, so that we may raise almost every kind of fruit, I am happy that we are to enter upon the discussion of this subject, and that we can have the pleasure of listening to the instruction of so able a gentleman as I am now permitted to introduce to you—Hon. E. W. BULL, of Concord.

Mr. Bull addressed the Board as follows:

GRAPE CULTURE.

When I have, on former occasions, had the honor to address you on the subject of grape culture, I have felt obliged to argue the *possibility* of establishing the vineyard in Massachusetts; for it was but a short time since the general belief that, though the grape could be made to grow and to yield crops by aid of skill, protection and favorable aspects, it would never succeed in open culture. I need not exhaust either the time or your patience to-day in that argument. The cultivation of the grape in the open air is to-day an assured fact. More than thirty acres are planted in Middlesex County alone, not counting the small holdings, which would probably swell the aggregate to forty acres or more.

In my immediate vicinity twenty-five acres are planted, five acres this season by a gentleman who had already achieved a complete success with former plantings.

We have historic record of the grape from periods of the most remote antiquity. Its culture is the poetic phase of husbandry. Poets have sung of it, and statesmen have found it worthy of their attention; for wherever the grape could be made to thrive, its products rose to the dignity of a commercial staple, and often a whole community derived their whole support from its cultivation. So great is its value, that in the wine countries of Europe, not only are the steep hillsides terraced with great labor and planted with the grape, but even rocky nooks, so hard that they must be broken with the crowbar, and so difficult of access that the workmen have to be let down with ropes to plant the vine and to harvest the crops, are planted with this choice gift of the Creator.

That the cultivation of the grape is more profitable than the usual husbandry of the farm, is seen in the fact, that even in those countries where wine is cheapest and most abundant, it is among their most valuable staples; it goes to the head of all their husbandry, and is the most profitable crop they can raise. I hope to show you that in our good old State, whose only staples have been said to be granite and ice, the cultivation of the grape is more profitable than any other.

But success in this new culture cannot be achieved without a proper understanding of all the aspects of the case. Soil, climate and exposition, as well as skilful and intelligent management, enter into the problem, and I propose to show, out of an experience of twenty-five years, the conclusions I have arrived at in this connection.

And first, let me say, that the grape is inflexible in its characteristics, and refuses, more perhaps than any other fruit, to bend to the arts of the horticulturist. Chaptal states this distinctly, as well as the ancient writers on the grape. Some vines, say they, cannot endure the fervid rays of the Italian sun, while others are naught without them. Some require space—climbing to the tops of the highest trees—while others need close planting, and can with difficulty be brought to the top of the espalier. Some are "patient" of vicissitudes of weather; others cannot endure them. Some are hardy against frost, while others cannot bear it. The famous Corinth grape, from which the "currants" of commerce are made, will only grow in a few localities which are specially adapted to it, and either refuses to grow at all, or changes its character, when grown elsewhere. "It is," says Denman, "extremely fastidious in its selection of the soil and temperature suited to its growth, and its after development is so slow, that for six years it bears no fruit at all, and does not yield a full crop before the fifteenth season. It thrives best on the southern shores of the gulfs of Corinth and Lepanto, and on ancient Peloponnesus. The only other places where it will grow, are three of the more fertile of the Ionian Isles, for they resist every attempt at transplanting to other countries of similar temperature or latitude. In Sicily and Malta, the cuttings passed into the ordinary grape, and in Spain they would not take root at all. Even at so short a distance as Athens, recent similar and persevering attempts signally failed, yet the fertile and lovely island of Zante is nearly buried in the profusion of innumerable plantations."

It is well known that the European grape is a native of Syria, and reached those countries where it is grown through the aid of commerce, in very remote times. Yet to this day it refuses to grow with such vigor as it shows in its native home, and requires great skill and labor to keep it up to a fair success. Still more difficult is it to grow this foreign grape in our own country; the most able and persevering efforts having failed to acclimate the vine, while of the numerous seedlings which have been raised from it, none are found to bear the changes and severities of our climate.

But one alternative remains. We must turn to the native stock which Providence has given us, and which has only waited for the ameliorating hand of man to improve and make edible. And this is quite possible; for, notwithstanding the inflexible nature of the vine in retaining the habits into which it was born, it is quite impressible to change through reproduction by seeds. If the seeds be sown in a bed highly charged with those elements which experience has shown to be peculiarly adapted to the grape, such as phosphate of lime, potash, sulphur and oxide of iron, with a liberal dressing of nitrogenous manures, the young seedling will find within reach of its rootlets such stimulus as will aid in restoring the vine to its pristine excellence, (if once it was of better quality,) or improve it in successive generations, so that you will ultimately graft upon its native hardihood and vigor the excellence of the table grape. So much has been done already towards accomplishing this purpose, that I think I may say success is certain.

Many years ago, Major Adlum, of Georgetown, D. C., planted a vineyard of the Catawba grape which he had brought from North Carolina, where it was native. From this grape he made a wine which President Jefferson pronounced equal to many of the French wines. When the experiments with the foreign grape, at Vevay, on the Ohio, and at other places, failed, the attention of grape-growers was drawn to this native grape, which was found to succeed remarkably well, and to make a wine of good quality. From this moment its cultivation steadily increased, until the wine crop, mostly from this grape, has reached the large sum of nearly two millions of gallons.

Well might Major Adlum claim that, in giving this grape to his countrymen, he had done more service than if he had paid the national debt.

This Carolina grape, however, was not suited to the short season of the north; it had also a constitutional defect, the rot, which often injured and sometimes destroyed the crop. Still, it was the first grape from which a good wine could be made, and the pioneer which led to the planting of vineyards, and wine-making—on the large scale—in this country. Many seedlings have been raised from this grape, but none of them have proved equal to the parent. Perhaps it is too far from its native haunts, and the seedlings revert to the type from which the parent sprung.

At the north we must have grapes which are hardy, vigorous and early, for our seasons are so short and our summers so changeful, that no others can succeed here permanently. Many good seedlings have been raised, and others are growing which assure us of complete success. These facts should encourage lovers of horticulture to raise seedlings; for the more numerous the efforts in this direction, the more prizes will be drawn, and the sooner we shall obtain those choice grapes for the table and wine, (now as I confidently believe, in the near future,) not to mention the double satisfaction of doing good to our fellows, and obtaining a pecuniary success at the same time. The seedlings should be protected from the hot sun until they get two or three rough leaves, after which they are safe. My experience leads me to the belief that seedlings from the same grape, raised in soils of different quality, and various locality, will be likely to vary in constitutional force, hardihood, earliness and quality, much more than when raised in one locality, (where all the circumstances of soil, aspect, &c., are always the same,) and consequently, the successes will be multiplied.

SEEDLINGS.

If you wish to obtain seedling grapes, select your seeds from the ripest and best bunches, having such qualities of earliness, vigor, size, beauty or excellence as you desire to perpetuate.

Plant the grapes whole, in rows one foot apart, for convenience of weeding. Plant the grapes one inch deep. When they come up, in the following spring, water and shade while young. Take up the vines in the autumn, carefully, for new vines will come up another year from the seeds which did not grow the first year; and from these slowly vegetating seeds you will have, probably, your best grapes. Keep the vines you have taken up in the cellar through the winter, and plant out in the spring in rows six feet apart, and the vines two feet apart in the row. After this, proceed with their culture as you do with other vines. I consider this method of originating new grapes the best, because it secures the vigor of the parent stock; and when you have broken the habit of the wilding, or, in other words, established the line of divergence from the original type, you have not debilitated your vines by the weakness of the foreign parent, as happens in hybridizing with them, a custom now recommended for improving the quality of our own grapes and the hardihood of the foreign.

Hybridizing, or cross fertilization, is so difficult, that able writers on the subject have pronounced it impossible. Some grape-growers, however, claim to have succeeded, and it is certainly quite possible that they have obtained true hybrids.

Let us look at this matter a moment, and see, first, what are the difficulties which hinder success; and second, if they can be surmounted, what would be the benefit of obtaining a true hybrid.

The blossom of the grape contains the germ, setting close upon the footstalk, five stamens which surround the germ, which are surmounted by the anthers which contain the pollen or fertilizing dust for the impregnation of the germ; and all these parts of fructification are closely covered by the calix, or cap. This calix is lifted by the elongation of the stamens, under the stimulus of the warm sun of June, and thrown off by their natural divergence. At this time the pollen is ripe, and instantly impregnates the germ; hybridizing under such circumstances is impossible, therefore, but is sometimes possible for the following reasons.

Grapes which have perfect blossoms, and whose stamens are long enough to lift the anthers to such a height as to shed the fertilizing dust upon the stigma, (which would insure impregnation,) may sometimes shed the calices before the pollen is ripe, or the calix may be carefully removed by delicate pincers, and the germ fertilized by the pollen of another variety. This would be a difficult operation, however, for the abundant *ripe* blooms opening at the same time would fill the air with their pollen, and impregnation would be likely to take place before the operator could act. He could, however, cut away all the blooms except those he wishes to operate upon, and after carefully removing all the anthers from those saved, with a pair of sharp-pointed scissors, *before the inflorescence of the pollen*, impregnate the germs with a camel's hair pencil. This is the surest method. But grapes are supposed to be hybridized sometimes without aid, or by accident.

This is not impossible. Some kinds of grape, like the Oporto, and some others, have defective stamens—either too short to reach the stigma, or contorted and weak—so that only a portion of the berries are impregnated, and grow. If the pollen of another grape, hanging over them, should be shed upon the unimpregnated germs, true hybrids would ensue; or if bunches of ripe bloom should be shaken over them, the same result would happen. Those berries naturally impregnated would give grapes by direct descent, and those artificially impregnated would give hybrids, so that this rude method would be uncertain. On the whole, then, we must conclude that it is possible to effect "cross-breeding," but uncertain and difficult. Suppose you have succeeded, what advantage have you gained?

A cross of the foreign grape upon the native is supposed to graft upon the hardy stock the delicacy of the foreign grape. It does more,—it grafts upon it the delicacy of constitution incident to the foreign grape. Witness one of the few unmistakable hybrids in this country—Allen's hybrid—bred from the Chasselas (one of the most hardy of the French grapes,) and the Isabella; it is not hardy enough to live out-doors without protection, and is liable to mildew, and late in ripening. You have got a good grape, but not a hardy one, and it is nearly as useless to you as a foreign grape.

On the whole, I prefer the grape raised from seeds by direct descent, for not only is it more hardy, but every improvement is the sure starting point for a still further improvement, whereas, the seed of the hybrid is almost certain to go back to the type of the strongest parent, the wilding.

SOIL.

Light and warm soils are best suited to the cultivation of the grape. This rule seems to be of nearly universal application, for even in sunny France—the land of vines—such soils give the finest grapes, the choicest wines. "The strata of the most valued vineyards being dry, gravelly or sandy, and exempt from that rich loam which engenders a rank and coarse vegetation." —(Denman.)

The famous "Margaux district is equally calcareous, flinty and sandy; the wine there raised is remarkable for its fragrant delicacy."—(Ibid.)

The composition of the soil of the famous vineyard of Chateau Margaux is as follows:

Inorganic matter, (gravel,)	85.427
Organic matter,	6.670
Carbonate of lime,	0.891
Potash,	1.291
Phosphoric acid,	0.147
Soluble silicates,	0.380
Magnesia,	0.263
Alumina,	1.590
Oxide of iron,	3.341
	100.000

In these soils the grape attains its best development—well ripened and close-grained wood and fruit-buds, and the juices of the fruit more concentrated and rich in aroma and flavor, than is the case when grown on richer soils, which are not only not necessary to the successful culture of the grape, as has been supposed, but really unfavorable, inducing a too luxuriant growth of wood, which, in our northern climate, seldom ripens perfectly; and the fruit-buds which it forms are seldom mature.

The gravelly hillsides which abound in our Massachusetts, bearing stinted herbage or thin woods, and sandy plains which bear only an occasional crop of rye, if planted with the grape will be found to yield more profitable returns than other crops on the best land of the farm. Two of my colleagues have this day informed me, that, on a piece of "blowing sand," in the town of Sunderland, which had yielded only an occasional crop of rye, they have seen a vineyard of grapes growing for these two years with health and vigor. This corresponds with my own experience. On a gravelly hilltop, which has had manure but once in twenty-seven years, viz., in 1856, I have a vineyard of the Concord which gives me my best grapes and makes my best wine.

There are, perhaps, some exceptions to this rule—some grapes which will thrive on a strong and rich soil. I know one instance, at least, which is in point. A gentleman planted on a hillside, with a clay soil, rich, but "pasty" in the early season, the Deleware, the Diana and the Lona. Neither of these grapes do well with me; but with him, in this clay soil, they grew with vigor and bore good crops. Other similar circumstances lead me to the conclusion that the grapes I have named need a rich soil, and perhaps a strong one, to arrive at their best state. This may also be true of some other grapes, but they are the exceptions to the rule of the case. Too rich soils should be avoided—especially wet soils. If the vines, after they have borne a few crops, show signs of weakness, light top-dressings can be given. Get your vines, if possible, from soil similar to that in which you propose to plant them; for if they come from a rich soil they will pine in a poor one; but if your soil is strong and moist, get your vines from a similar soil, if you can find vines which thrive in it. It is of equal importance that you have a good

ASPECT.

A south aspect is undoubtedly the best, and a hillside better than the plain. In such an aspect the grape receives, in the autumn, when the grapes are ripening, the greatest amount of heat the climate permits. Shelter, also, is important, concentrating, as it does, and holding the heat, which, in the open plain, is blown away by every wind. In the shelter of adjacent woods the accumulated heat stays about your vines, quickening the flow of the sap, and promoting largely the early maturity, and improving the quality of the grape. Such a location is equivalent to a latitude farther south. Do not be afraid to plant the grape because you do not happen to be upon the isothermal line, or have the aggregate heat which theorists prescribe as the essential preliminaries to success. You can make latitude and concentrate heat, and thus achieve success in spite of theory.

Wherever a grape-vine grows, another may be made to grow; and I have no doubt we shall have vineyards in all New England. Wherever the intense summer heat can be made to bear upon a vine *at the time of the ripening of the grape*, the grape is sure to succeed.

This rule requires the early grape for the short summers of northern latitudes; but where Indian corn will ripen, there the grape also will ripen; for we have grapes that ripen in August, and during that month great heats prevail, unless, indeed, heavy rains rob the earth of its accumulated heat, and chill the atmosphere with shade. But this does not often happen. Let me tell you a circumstance which illustrates this point. There is a vine growing in Concord, N. H., which was planted, in 1856 or 1857, against the south side of a house with an L which protected the vine against the west wind. The roof of the house came down to within nine or ten feet of the ground, and the vine was carried up over the roof upon a trellis about one foot from it, and covers an immense area. This vine has borne, for two successive years, the enormous crop of six hundred pounds each year. Notwithstanding the heavy crop, it ripened its fruit the first of September, and was of such fine quality and size as to sell in the market for fifty cents a pound. This grape is the Concord grape, and the fact of its ripening two weeks earlier than the same vine does with me, proves the value of concentrated heat and shelter for the vine. The theory of isothermal lines offers a very plausible theory in reference to grape-growing, and it is certainly worth consideration, and of some service. But what I have said about aspect and heat is a sufficient guide to the cultivator. The line upon which the Concord is placed by these theorists, passes through Boston, and then south of it. But here is a Concord, in the capital of New Hampshire, which ripens two weeks earlier than the same grape in the latitude of Boston, and in other places in the vicinity of the same city where it is grown.

PLANTING.

Most writers on the grape agree that it is necessary to trench the soil to the depth of twenty inches or more before planting the grape, and also to enrich it with large quantities of manure, bones, dead animals, &c.

Trenching is practised in hot countries, and the depth varies according to the heat of their seasons. In France, they trench to the depth of twenty inches; in Spain, thirty-three; in Italy, still deeper—often going to the depth of five feet. In this deep soil the long cutting is planted, by aid of a forked instrument, with the aid of the weight of the planter on a stirrup placed on the side of the instrument. The cutting is thrust to the bottom of the loosened soil, and makes roots throughout its whole length. This method of planting is a precaution against the droughts incident to the hot climate of that country, which heats the soil to a great depth, so that the lowest roots have a congenial temperature to grow in.

I was led out of this practice by a little incident. We had been planting vines, and, at night, one remained. It was taken to the garden and laid in by the heels, to be planted out the next day, but was forgotten. During the succeeding summer the procumbent stem threw out numerous roots into the hot and dry surface soil. This arrested my attention. Why should it throw out roots into the surface soil unless it was on account of its greater heat? I removed the plants near it and let the experiment go on. This was ten years since; the vine has never had manure, but has grown vigorously, and has for two years past given me annually, two bushels of the finest grapes. I have traced one of its roots twenty-five feet, and found it lying at the depth of only four inches from the surface. Here was sufficient proof of the folly of trenching. When you trench and enrich the under soil, the roots go down after the nutriment. Now that sub-soil does not, in most localities, get warmed to more than fifty degrees during our short summers. The surface soil, to the depth of six inches, is heated to seventy and eighty degrees. In this hot surface soil the grape thrives; in that rich but cool sub-soil, it sucks up rich, but crude and indigestible fluids, which keep it growing late into the autumn, but do not ripen the fruit so early as well digested and ripe fluids would. The fruit is consequently later, and as the grape expends all its energies in ripening off the crop of fruit before it ripens the buds for the next year's crop, the buds do not get well ripened. The fruit of the next season is thereby made later; the wood still later, until at last the vine will hardly ripen its fruit at all; almost certainly not to its proper condition, and the vine is, perhaps, condemned as too late, or imperfect, when the fault lay only in the mode of cultivation.

Plant, therefore, in the surface soil. Six inches will be deep enough for dry and warm soils—four inches for strong, moist ones. My custom, in planting the Concord grape—and I have had entire success—is to plough the land as you would for corn, harrow the surface, and spread about forty loads, or ten cords, of compost to the acre, to encourage the formation of roots in the young vine. After this the vines will want no more manure. Mark out the rows ten feet apart, north and south, and open two furrows four feet apart, turning up a ridge between them, which must be on the line upon which you are to plant the vines. Go through the furrows several times, until you deepen them to about nine inches. One man bestrides the furrow at the end, and shovels out the ridge of the furrows upon the headland, making a level table the whole width of the furrows, and six feet in length, to the depth of six inches. Another man places the vine in the centre of this table, carefully lays the roots in straight lines, diverging from the stem like the spokes of a wheel, and the first man, stepping back, and bestriding still the ridge of the furrow, covers the vine with the soil, thereby displacing just enough from the ridge to make another table for the next vine, and so on until the field is planted. This is the best and most expeditious method I have tried. Run the cultivator through the rows in the summer often enough to keep down the weeds. This is all the culture of the first season.

The second year tie up to poles for the purpose of getting a straight stem. Pinch the growing shoots occasionally to consolidate the wood and strengthen the buds. Do not allow the leading shoot to go beyond the top of the pole—six feet at most—nor let the side shoots grow more than one foot long.

You will think these rows too wide apart; but I find, in my experience, they are quite near enough for all strong-growing vines, like the Concord, and even with the slower growing vines. I would prefer to plant more closely in the row—say three feet apart—than to lessen the width of the rows; for, running north and south as they do, the sun lays upon the ground, and upon the whole length of the espalier, during the four or five hours of the middle of the day, when its heat is greatest, warming the soil down to the roots of the vines, and quickening them into vigorous growth. Never shade your vineyard if it is possible to avoid it.

At the end of the second year prune your vine to one stem, long enough to reach the lower bar of the espalier or trellis, which it is now time to make, unless you prefer to train the vines on poles.

I prefer the trellis because it is more easy to manage, (if the vine is hardy, and does not need to be taken down and protected during winter;) the surface will be flat, and it will be more easy to pinch the vines in summer, and to gather the crop in autumn. If the vine is trained upon poles, its long shoots hang over and upon each other, the leaves get smothered and die for want of light and air, and in case of long-continued rain, both leaf and berry may suffer with mildew. Another advantage, is that the trellis will last a dozen years or more without repair, while the poles must be renewed every year or two.

The trellis may be easily made by setting posts between the vines, at twelve feet apart, and nailing two pieces of scantling upon the posts, one at twenty inches from the ground, and the other at six feet from the ground. Now take wire of one-eighth of an inch diameter and fasten to the top and lower bar at about three inches from each other. The growing vine will attach itself, by means of its tendrils, to these wires. The growing shoots lay along this flat surface, securely fastened by their own act, and are well exposed to light, and air, and heat, the great essentials of success in grape culture.

These wires, I may add, will be as durable as if galvanized, if they are carefully annealed in a charcoal fire, and much cheaper.

Having made your trellis, and got the strong stem of your vine up to the first bar, you will allow only the two eyes nearest the top of the vine to grow. Train these growing shoots upon the espalier, right and left, at an angle of about 45°, thus giving to the vine the form of the letter Y. Pinch these growing arms occasionally to strengthen the wood and the buds, and, in November, prune them back to a strong eye and strong wood; for these arms are to yield, for all the future, the bearing spurs which are to give you fruit. In due time these side arms will reach the top of the espalier, beyond which they are never to be allowed to grow. They will have alternate spurs, or branches, growing from every eye, which are to be pruned in the autumn to one, two or three eyes, according to their strength. It is desirable to keep the bearing wood as near to the old wood as possible; and to do this it will be necessary sometimes to cut out occasional spurs to the lowest eye. These spurs, alternate, over and under, will bear you fruit annually. If the buds on the spurs are too close, rub out a portion of them, that the rest may have sufficient light and air for healthy growth and for ripening the fruit.

But it is really of very little consequence what form the vine takes—it may even be contorted into grotesque forms—it will give you crops so long as it makes new wood for the bearing spurs. You may grow your vine, at first, in any of those beautiful forms pictured in works on grape culture, but you cannot keep them to that form. Some buds will die out, and others push with such vigor where you do not want them, that they will get out of hand. The trellis, with the grape trained with diagonal arms and spurs, gives you, perhaps, the most enduring form. Some, however, prefer the system called the renewal system, which I proceed to describe.

The renewal system of pruning consists in making and fruiting long canes of the vine annually, instead of the short arms of the spur system. Those who adopt this system usually lay in upon the espalier two horizontal arms, right and left, from the main stem, upon the lower bar of the espalier. At the autumn pruning alternate spurs or shoots upon these arms are cut down to one eye to make bearing canes for the next year; and the intervening shoots, carried to the top of the espalier, are fruited in their whole length. The alternate single eye left at the last pruning grows to the top of the espalier, and furnishes the bearing wood for the next year; those which have borne fruit are cut back again to one eye, to make bearing wood for the next year, and so on, *ad infinitum.*

The objections to this system are, that on these long arms the topmost buds push with great vigor before those near the base of the cane, and those buds nearest the main stem of the vine push with greater strength than the others, so that it is well nigh impossible to keep the vine well balanced, and it is quite sure to get out of hand before long.

The spur system gives you the first formed and ripest buds nearest to the old wood, and of equal strength; and experience proves that they ripen their fruit earlier than the long cane. This system of pruning is now generally adopted.

PROPAGATION.

Nothing can be more pernicious than the now prevalent mode of excessive propagation—by which I mean the making of vines from single eyes in heat; or, what is still more objectionable, from green and growing wood. I know that eminent horticulturists believe that, if the subsequent culture is judicious, the vine will be just as good as if raised from cuttings or layers in the open air; but this is an open question, and it is almost certain that, with the present imperfect knowledge of grape-growing, the subsequent culture will not be judicious and skilful enough to insure good vines from such doubtful beginnings. In my experience, even in the open air, the light wood at the end of the shoot will give you a vine which will not bear so soon, by years, as the riper and better wood near its base; and I annually burn cords of such wood rather than propagate from it; and I am perfectly satisfied that any debility of the vine, however it comes, will continue for years, and in some instances until the vine is lost. I presume that in this way we are often disappointed in vines which are put upon the market as hardy and early grapes, and which we are surprised to find feeble and late.

The ancients believed that the best vines were obtained from the shoots nearest the main stem of the vine, and propagated from no other. At Thomery, near Paris, they select the shoots bearing the earliest ripe grapes for propagation, and believe they thereby increase their precocity.

I think the best method of propagation is by cuttings of *well ripened wood.* They should be of two or three eyes. Planted in good garden soil, moist but not wet, they are as sure to grow as the currant. Layering is a very good mode, and easy of practice, but the French vignerons believe that vines raised from layers are shorter lived than those raised from cuttings. This mode ends in the destruction of the parent plant in three or four years. If, however, you happen to lose a vine in your vineyard, you may restore it by layering a long shoot from a neighboring vine to the one you want to replace. After it is well rooted, separate it from its parent and train it in the place of the last vine. In this way your vineyard will always be kept full of vines—a matter of some importance. But our people will not go into this cultivation unless they can see whether is

GRAPE GROWING PROFITABLE.

I trust I have shown that grapes can be grown as easily as any other crop. I would as soon take care of an acre of grapes as "make" an acre of corn. They find at the West that one man can take care of five acres of vineyard. The same thing can be done here. You plough and cultivate as soon as the frost is out, and again in the summer, to keep down weeds; you pinch the growing shoots two or three times to consolidate the wood. When you come to the harvest, invalids, old people and children can gather the crop as well as the strong man, and a merry harvest it is. There is nothing like hard labor about it. It does not draw upon the farm labor at seasons when it can ill be spared, nor intercept its profits in other directions.

It is a fact within my own knowledge that two thousand dollars per acre has been realized for the grape crop this year. The price has steadily advanced for several years (notwithstanding the increased supply,) from ten cents per pound to twenty cents, wholesale. At ten cents per pound, the full crop of an acre would come to $1,400, and at twenty cents, to $2,800. The crop from a well established vineyard of the Concord grape will be seven tons. This has been exceeded in Massachusetts. Mr. Jode, of Burlington, Iowa, had 8,860 pounds (or nearly nine tons to the acre,) of grapes from a vineyard of one-half acre in extent; the vines four years old, and the crop the first gathered from them; the grape was the Concord. A gentleman of your county has gathered from his vineyard, crops, the value of which has averaged seventeen hundred dollars to the acre. I have raised seven tons to the acre, and I have shown you that others have raised more than that.

But suppose you do not get but half that crop, and but half that price, you have an income of seven hundred dollars per acre. Suppose, even, you reduce this last sum by one-half, is there any other cultivation which will give you such profits?

If the grape crop should ever be so large as to glut the market,—an event which cannot occur for many years to come,—it will still be a commercial staple in the form of wine. The wine product of the United States, which was, in 1850, 218,023 gallons, had increased to the respectable figure of 1,617,957 gallons in 1860. California alone made 2,000,000 gallons in 1865, and it is believed that the next census will show an annual product of not less than 10,000,000 gallons for the whole United States.

In France, whose population does not much exceed that of our own country, the average production of wine is 884,000,000 gallons; worth, at the press, twenty-five cents a gallon, or $221,000,000 for the whole crop. The aggregate number of acres devoted to the grape in all Europe, is 12,285,780; the aggregate annual crop 3,107,039,000 gallons, and the aggregate value of this crop, $763,733,500, this last named magnificent sum being the amount received by the producer, and it is safe to believe the value is doubled in the hands of the wine merchant. The figures were derived by Haraszthy, from official documents, and are probably correct.

The value of the wine, at the press, in Missouri, is $1.61 per gallon; the yield from 250 gallons to 600 gallons per acre. This gives an income of from $400 to $960 per acre.

These values would not be lessened here at the East, but rather enhanced. I have made six hundred gallons of wine from one acre, without the addition of water, or spirit, which, I think, should never be used. You can see, then, that the grape-grower can always count upon a sure market, and a remunerating price for his crop.

Many people object to the introduction of wine-making in this country on the score of morals. They fear that when we come to be a wine-drinking people, we shall be an intemperate people. I need not say—what all the world knows—that the people of the wine-growing countries are the most temperate on the face of the earth. Instance the French people, who make over 800,000,000 gallons every year, and who consume more than twenty gallons annually, to each person in the empire. In that country, where so large an average consumption of wine prevails, you find a temperate and happy people; industrious, economical, cheerful and healthy. No dyspepsia, no disturbance of the bodily functions, such as are incident to those nations whose stimulants are more ardent, and therefore less healthy.

The imported wine, however, is very different from the pure wines from our own vineyards, being largely reinforced with brandy.

This is the product of distillation, and is one of the forms of pure alcohol, and is as unchangeable in its characteristics when mingled with wine as when mingled with water. You drink wine and alcohol, and not pure wine; the alcohol is an excitant, a poison; the pure wine is nutritive,—liquid grapes,—and digests into generous blood, giving fulness to the pulse without exciting it. Alcohol goes into the circulation without change, reaches the brain,—as alcohol,—affecting it unfavorably, with undue excitement, and is followed by inevitable reaction.

The inhabitants of wine countries are perfectly aware of this. They do not drink "brandied" wines, but the lightest and purest to be obtained, and these are given freely, even to children of a tender age.

A friend of mine, a clergyman, visited France for the recovery of his health. He was advised, by one of the most eminent physicians of Paris, to travel on foot through the wine-growing departments of that country, to live mostly on grapes, and to drink the pure wine of the country. He followed this advice, and he assures me that, out of the large cities, he saw no intemperance.

Stopping one day at a wayside inn, he saw, opposite his window, one of those seminaries, half convent, half school, which abound in that country. It was the hour of noon, and the young ladies, mostly of the age of ten or twelve years, came and seated themselves on the beautiful lawn, in the shade of the fine trees, to lunch. The dainty napkin was removed from each little basket, and with the cold chicken and choice French roll, came out, also, a bottle of wine! Do you suppose parents would give wine to their children, at that tender age, if they supposed it would promote intemperance?

Mr. Barnard.—Some parents give whiskey or New England rum to their infants.

Mr. Bull.—Not often, I think, and not wisely. Perhaps it goes to show the almost universal belief in the necessity of stimulants, at times.

Mr. Barnard.—Will not wine intoxicate? What per cent. of intoxicating property does wine contain?

Mr. Bull.—I presume a man may become intoxicated on any fermented drink, if he desires to, and by the use of large quantities. When we say that wine contains thirteen per cent. of alcohol, we do not mean that it is already alcohol, but that the wine yields that per cent. when distilled. In the wine, before distillation, the alcohol is in such natural combination with the other constituents of the wine that it is not unwholesome; after distillation it is a poison.

You may analyze wine and ascertain precisely the proportions of its alcohol, sugar, mucilage, ether, &c., but no synthesis, though the proportions be observed with the utmost accuracy, will give you the wine you had before. You have broken that intimate natural combination which is impossible to restore.

You will observe I am speaking of *pure* wines. Much "pure spirit"—medicated and deodorized alcohol—is used by makers of native wine, in the belief that it is necessary, because imported wines contain a certain proportion of alcohol; but it is really never necessary to add spirit to wine, which will keep perfectly well if it contains a sufficient quantity of sugar, and if it does not, that substance must be added.

There is another consideration to which I wish to invite your attention for a moment. In no other country in the world is there so much necessity for individual culture as in this, for here every man is a part of the State, and should be a pillar and support to it. The State, which is only the aggregate of its individual members, is weak or strong, according to the manhood and culture of its units, and these qualities are hardly possible without a competence. This makes him really independent; he may follow his conscience, and his vote will not be influenced by circumstances which too often bias the vote of the poor man. How many men do we have in this pattern State of the Union, the most wealthy and cultivated, in proportion to its numbers, of any on the face of the earth, who are obliged to toil early and late to scrape enough together to make, in their homely but expressive phrase, the buckle-strap meet, and to educate their children so that they may have equal chance with their fellows, to rise to that higher plane to which society is steadily advancing? But if these men with their narrow means succeed so far as this, they have but little means or leisure for reading and self-culture, both of which imply freedom from penury and incessant toil. Suppose he has an acre of grapes, it will not lessen the working capital necessary for his farm. The light labors of the vineyard can be performed by the females and children of his family—by invalids, even. It needs no manure after the first year; his farm crops are not, therefore, stinted, and the jocund harvest brings him, *possibly*, $2,000, *certainly*, $500. What "infinite possibilities" lie in a clear income of $500 per year. Nothing gives me so much pleasure as to think that manhood itself may be benefited in that way.

THURSDAY AFTERNOON.

The Board met, agreeably to adjournment, at half-past two o'clock.

The President announced that the subject for discussion was still *Fruit Culture*.

Hon. E. W. **Bull**, of Concord.—I find that some of my colleagues did not understand me, as to the distance at which I would plant the grape. The distance I allow is six by ten feet; that is sixty square feet to a vine, giving seven hundred and twenty-six vines to the acre. There has been some doubt expressed, also, as to whether it is really best to have the rows run north and south. If your rows run north and south, they make considerable protection for each other against the east and west winds; and then again, the morning sun does not have much force in its beams. If the heat falls upon the plants about ten o'clock, the earth between the rows is open to receive the heat; and from ten, A. M., to three, P. M., there will be a hot sun upon the espaliers, and upon the space underneath, heating the grape to a considerable degree. A friend of mine, being out hunting on the 27th of July, found some perfectly ripe grapes on a vine growing upon a wall running north and south, and meeting another wall running east and west, so as to protect the vine and give it great heat. That vine was taken up and transferred to another place, when it ripened only as other vines do, later in the season. This shows that the sheltered and heated places are best. I have had the thermometer rise to 130° on the ground under the vines, although in the shade it rose only to 100°; and in a season when the corn leaves rolled up with the heat, the grapes did not suffer at all, but were larger and better than ever before. The earliest bunches ripened the 3d of September. A gentleman in Weston planted a thousand grapes a year ago, and some of the young vines, in hot aspects, ripened grapes this year, the first week in September. Dr. Grant, on his island in the Hudson, where the heat is intense, and where the fogs keep off the spring frosts, has Iona grapes ripe early in September. Andrew Fuller says they ripen with him, at Brooklyn, New York, on the 15th of September.

A strong-growing grape like the Concord and Hartford Prolific, if pushed for room, makes too much wood. The whole art of pruning lies in having a proper balance between the root-power and the top. You want bearing wood, and to prune in such a way as not to get long, crooked stems. Your seven hundred and twenty-six vines will give five pounds to the vine the second year. You must take off what is over and above that. The next year you may take ten pounds to the vine; the third year fifteen, and the fourth twenty, and constantly after that the same. I have known some vines give thirty pounds the third year; but it is not prudent to impose so heavy a burden upon the vine. You want to crop your vineyard as if it would live forever, for the vine is long lived.

There are vines which are supposed to be two thousand years old. There is one at Richmond, Va., forty-eight inches in circumference. There is one in Burlington, N. J., which is two feet in diameter. The Patent Office Reports speak of a vine in New Jersey that gave seventy-eight bushels of grapes in one season. From the seven hundred and twenty-six vines you will get about 3,500 pounds for the first crop, and double that the next year, and so on, unless something shall cut them off. The succession of crops of grapes that I have had for sixteen years, without any failure, proves it one of the most constant crops we have.

The best season for pruning is unquestionably November. The tissue is then become fibrous, the grape has fallen, and the leaves also; and if you prune then, however rudely, the vine closes the tissue so completely that it will not leak sap in the spring. That is one reason why November is the best time to prune. Another is, that so long as the sap continues to move, organizable matter continues to be laid up, which strengthens the buds. If growing for cuttings, I am inclined to think the end of November would be better, because the wood and the buds would then be stronger. You may prune, however, all winter, and at any time before the first of March, from hardy vines. If you are going to cover the vines, you must prune early, so as to let the vine heal up the wound before it is covered. Vines that are to be covered should be pruned in October, as soon as the leaf falls.

In a single row, with abundance of space on each side, the vines might be placed nearer than I have indicated. I think they should not be nearer than four feet. I planted grapes four feet apart each way eleven years ago, and I have got to dig out every other one of these each way to make room for them. They are a perfect swamp, notwithstanding the nature of the soil. But there, on that gravelly and heated soil, I get the best quality of grapes I have grown.

Mr. STEDMAN.—What shall be done if a vine has been neglected till it has become a perfect mat; which bears fruit every year, but the fruit is shrivelled?

Mr. BULL.—The shortest way out of that difficulty would be to remove it altogether and begin anew. If you want to save that vine, begin and remove a little of the wood at a time, until you restore it to shape.

Mr. SMITH, of Sunderland.—Is it any benefit to the Concord vine to be covered in winter?

Mr. BULL.—Not the least. I have twenty thousand Concord vines, and if anybody would cover them without charge, I would not have it done. I used to entertain a different opinion; but from experiments that I have made I am satisfied it is better not to be covered. But there is no alternative with the tender kinds of grapes. You must cover them. And if you grow a few of these excellent grapes, the best way to protect them is to lay them on the ground and cover with one or two inches of earth. Earth is the very best covering you can have.

Mr. FLINT.—It is well known that some grapes have had a disease the last season, in some instances rotting the whole berry. That is the case with the Isabella, I have noticed, in Grafton and other towns. I would like to ask for the remedy.

Mr. BULL.—The Isabella rarely rots. There is a "rust" which sometimes touches grapes, and that goes from that diseased basis down into the berry. I saw some grapes this season nearly every one spotted in that way. Mildew, which is another form of disease, is a true fungus; it floats in the atmosphere, and under the microscope it is very beautiful. It feeds upon the grape, and ultimately destroys it.

A gentleman has mentioned to me a case which he considered mildew, but which I suspect is something like what they have in California, on the coast, where there are great changes in the temperature. A writer says that the grapes exuded a juice which hardens on the surface during the prevalence of cold winds from the coast; subsequent wet weather washed it off, and the grapes went on to ripen. We have some such sudden alternations which might produce that result. I do not have a single bunch mildew. I have seen some specimens of the blight attacking a single berry and spoiling it, while the rest of the cluster ripened perfectly. A gentleman of my town has a little garden on the *west* side of his house. His house stands north and south. There is the house and its back offices, then an interval, and then the barn beyond. We looked upon his vines for the blight, and wherever the building protected the vine from the easterly wind there was no blight; but opposite this interval, where the east wind could come, there was the blight. No art could guard against it. Premature heat had started the blossoms and the sap, and then came the sharp, cold weather, which blighted the buds that required continued heat and dry weather.

Mr. Sawyer, of Harvard.—I had some trouble with my grapes last year, and also about five years ago. When they first begin to ripen I find little cuts in them, as though cut by a pair of scissors. The juices of the berry leak out, and they shrivel up and drop off. My neighbors had the same trouble this year. It has been a serious evil with us.

Mr. Bull.—Did the grapes crack?

Mr. Sawyer.—No. They looked as if cut with a pair of scissors. The Concord, Diana and Hartford Prolific were affected in that way, but the Isabella was not.

Mr. Bull.—What is the nature of the soil, and your treatment of it?

Mr. Sawyer.—It is a heavy, granite soil, not very deep nor very rich. The trellis runs along by the side of a common pasture wall, some four or five feet from it.

Mr. Bull.—I never have met with anything of the kind, nor heard of it before. If it were owing to any defect in the soil I think the remedy would be found in ashes. Cracks in pears are cured thus. I have seen small fruits galled in that way by birds.

Mr. Capen.—Does Mr. Bull mulch the grape-vine?

Mr. Bull.—I do not mulch, for a reason that is very obvious. I want all the heat I can get, and mulching intercepts the heat of the sun at the root. It don't make any difference how dry the season is. If I had a kind of vine that required watering, I would take a cask that was leaky and put in leaves, and on the top of it I would put a shovelful of horse manure or ashes to neutralize the acid, and fill that with water once a week. That would filter so slowly as to feed the vine properly. I don't think I should ever mulch a grape vine under any circumstances.

Mr. Capen.—My soil is a gravelly knoll, with a sub-soil of fine sand. It always suffers in dry weather.

Mr. Bull.—In such a soil I should be astonished if anything grew. The *sandy loam* of my soil never suffers. I would never use the spade about the roots of the grape, but a fork. The ancients never used the spade about the grape; they used the old *bidens*, and stirred the ground with it thoroughly.

Mr. Leander Wetherell, of Boston.—During the dry season of last summer I visited the garden of a gentleman in Saxonville, which is on a light, sandy loam. Everywhere around his garden the leaves of the trees and plants were shrunk and withered; but I noticed in his garden everything looked green and fresh. I observed on his grounds, especially where the pear trees were, the ground covered with mulch. The gardener said that without it he would have no fruit. The pear trees were well fruited, and were ripening their fruit finely; as he maintained, under the influence of the mulching. I think the pear and apple tree need mulching, but I do not think the grape needs it.

One word with regard to covering vines. I visited a plantation of raspberries and blackberries at Oak Hill, in Newton, and the man who was cultivating them had been remarkably successful with all that kind of fruit. He said his mode of cultivation was, to lay them down and cover them lightly with soil in the fall, and bring them up again in the spring. He ascribed his great success in raising these two kinds of fruit to his mode of cultivation. A gentleman who sits behind me says he has found it of advantage to lay down even the Concord grape.

With regard to the peach, I saw, in the garden of Mr. Simpson, at Saxonville, to which I have referred, what he calls the ground culture of the peach. He had a trellis about eight or ten inches above the ground. Thus far he had been successful in growing the peach, because in this way he could cover and protect them in the winter. The frame was made with posts in the ground, and slats fastened on, eight inches above the ground. The trees were spread out within eight or ten inches of the ground, and covered during the winter.

Mr. BULL.—I do not wish this audience to think for a moment that mulching is not excellent for fruit trees. We know that raspberries and blackberries cannot be grown without mulching. The best growers, we know, do it. I know some cultivators cover the Concord grape. I do not believe it is necessary. If so, it would be because cultivated with manure, so as to make considerable unripe wood. I would never mulch the Concord grape.

Mr. COLTON, of Worcester.—We find, in Worcester, we must cover the Concord.

Mr. BULL.—There are twenty-five acres growing about Concord, and not one vine is ever covered, or ever need be. I had some little vines in one part of my garden, near the meadow, and I wanted to graft some of my seedlings on some of these young roots. My boy took up some of them, at the very end of the season. He had got one row out, and it was left open the day before it froze. The trench within eight or nine inches of the row left, was open all winter, full of snow and water and ice. Every one of them was alive in the spring. I have known them with the crown of roots standing out all winter, and yet living, although the bark of the roots turned green, like the bark of the apple tree. They never need covering.

Mr. COLTON.—Would not the gentleman make an allowance for locality? We are five hundred feet above the sea, which is equal to a degree of lattitude.

Mr. BULL. If the *wood is not ripe* they will need it; but if the wood is kept ripe by pinching, they will not.

Mr. COLTON.—With regard to the richness of the ground, I used to advocate planting vines in very rich soil; but I think they make less wood and more fruit, where the soil is rather poor.

Mr. Bull.—A gentleman in Maine had some Concord vines which he was accustomed to cover; but being absent from home two years, the vines were utterly neglected during his absence, and they were loaded with fruit. Down in Saco, where the climate is severe, he thought they must be covered; but when they were let alone they did better. I must repeat, I do not believe it is ever a benefit to cover the Concord vine.

Mr. S. V. Stone, of Worcester.—I have raised a few grapes. Most of my vines are Concords. My lot is 110 by 130 feet, with buildings on it. I raised, last season, thirty bushels of grapes. I have not covered them for the last three years. My experience is, that my vines have done better when not covered than when covered. I trim them in the fall, and lay them down on the ground without covering, and train them up in the spring, and I have very good success.

Hon. J. M. Earle, of Worcester.—I believe, so far as my observation goes, that people almost universally cultivate grapes too highly, as they would the pear, so that the wood does not ripen. I think that is the general rule here. In confirmation of the remarks of Mr. Bull, I would state that five or six years ago, I left the place where I had been living, but still kept the garden in my possession; but it was neglected. I had there two Diana grape-vines from which I had never succeeded, when I did cultivate well, in getting any fruit. After I left, the vines were entirely neglected; they run up over the trees, and to my surprise, I found them, two or three years since, bearing well, with fruit that ripened perfectly. So it was for two or three years in succession. The Diana grape, which is called a tender grape, left to grow wild, succeeded well, although it had not, when cultivated highly. The grapes were better than from cultivated vines, dissolving entirely in the mouth, leaving no pulp, and that without much pressure of the tongue, either.

Dr. Miller, of Worcester.—Would Mr. Bull recommend throwing on slops from the house, or watering the grapes frequently?

Mr. Bull.—I have killed young vines in that way, when I did not know any better. The soil is apt to become compacted, and cause the loss of many young vines, by throwing soap-suds and other slops about them when the vines are growing. When the vine is large, it is a good practice.

Dr. Miller.—If you were to cultivate a garden grape, would you plant it near a cess-pool?

Mr. Bull.—There might be circumstances where I should be compelled to do it. In that event, I would plant as far from it as possible, so that the sharp points of the little rootlets would take up homeopathic doses; but the vine would grow too fast, the wood be immature, the crop late.

Col. P. W. Taft, of Worcester.—I set a vine close to a cess-pool; it grew very vigorously and had a very heavy crop of grapes; but it continued to grow till the frosts set in, and the whole of the last year's growth was killed entirely. I would not recommend to any one to set a vine near such a place if they had any other.

Mr. Bull.—We know that wool waste has been recommended as a manure for the grape; and Mr. Simpson, of Saxonville, has had eminent success in using it. His experience was so promising that I bought some wool waste, and after using it on my hot-house border, I had it taken to a patch of seedling grapes, where I wanted to get as much growth as possible, and had it worked in lightly. Those vines scarcely lived through the next summer, and were in a bad condition; and I found that all the roots they had at the time of putting on the wool waste, were dead and rotted. Where the sweet soil above the wool was, they put out a circle of roots like the spokes of a wheel. I cut out the dead roots, and the vines now continue to grow. Grapes like mineral, but are impatient of gross manures. The ancients knew all this, and you will find it in their writings. In some municipalities in Spain they have special enactments against manuring, lest it impair the flavor of the grape. But time and patience, and such manures as I have mentioned, are indispensable; gross manues are never safe. If the leaching of the gross manures reaches the roots they will die.

Mr. Earle.—How did your grape vines endure the severe winters of 1861 and 1862?

Mr. Bull.—I have not lost any of the Concords, even of the seedlings, which I never protected at any time. I had an Isabella, which, in the severe winters of 1857, 1858, and 1859, was killed. My position is unfavorable for the grape. It is in the low level of the Concord Valley, where there are late frosts in spring and early frosts in autumn, and a light soil. Many grapes which fail with me might succeed perfectly well elsewhere. The gentleman in Natick to whom I referred, whose soil is a rich clay, raises the Delaware admirably, which is a case in point. The general fact with regard to the Delaware in our vicinity is, that it grows slowly, and produces small grapes. If it has a liking to a peculiar kind of soil, it is worth while to try it in such soils.

I have a trial terrace, where I put all new grapes, for trial and comparison. At the end of the terrace grows the Iona, two years old; next to that the Kreveling, and next the Adirondac, both of same age. These are treated in the same manner. The Iona grows very feebly; the Kreveling has a yard or a yard and a half of ripened wood, and the Adirondac ripened two shoots of that size this year. But this is only one instance. Were the circumstances changed, the Iona might prove to be the best of all. I wish gentlemen would give attention to this matter, and ascertain what is best. We are only on the threshold of growing grapes. If I have grown grapes for thirty years I have only ascertained how much there is to learn. It took years to get rid of what I thought I knew.

Mr. Clement, of Dracut.—Mr. Bull remarked, in the morning, that native grapes could not be improved by cultivation. Most boys, who used to ramble around to find wild grapes, thought they were pretty good to their taste, because they never saw any other. When I came to my farm I had grape "on the brain," and I do not know but I have it now. I have travelled many miles to get some of the better class of, as we called them, wild grapes. I had a number of them on grounds that inclined to the south; but I could not improve the quality of them. They were not one particle better than they were when I used to pick them in the wild state.

With regard to pruning, I fully believe one good pruning every year is necessary; that should be in autumn. If not pruned they straggle off in every direction. More than one pruning is not necessary to get a good crop. I do not wish to discourage people from giving all the attention to the cultivation of grapes that they can. They are apt to be discouraged when they hear so much about pruning and pinching. All this is not really necessary to have good grapes. Let every man plant grapes, and give them one good pruning, and let the sunshine fall among them, and let them have good clean earth, and I venture to say you will have good grapes.

The apple has been, with me, more of a specialty than the grape, because I regard it of more importance than all other fruits. I presume there are many gentlemen here who will say they would rather dispense with every other fruit than the apple. The apple is a fruit which we can have the year round, and it can be used in so many ways that I am sure we all feel as though we cannot give it up. It is so scarce this year in Massachusetts that we all feel the want of it; we all realize that we have lost something that is good. We all hope we shall have some next year. We all like apple dumplings, and used to like pan-dowdies, which, I believe, are getting out of date.

Prof. CHADBOURNE.—They are coming in again.

Mr. CLEMENT.—I hope they are. We all used to know how to prize them. There has been so much said in agricultural papers on the apple, that what I may say may be considered trite, but I will venture to offer a few words.

If I was to plant an apple orchard, I would choose a side hill, somewhat elevated, of a granite formation, and having some rocks. I have found they do well in such soils; on our rocky side hills,—which we sometimes call oak land,—with a gravelly surface, and a hard pan two feet below. The trees in such localities are more hardy. There should be still higher lands on the north and west; or forests would be better. Hills open to the north and west are not so good, because the winds are strongest from that direction. I have seen whole orchards leaning to the east on this account. I dislike to see trees leaning; I wish to see them stand upright, and with the head well balanced.

The kind of apples I would cultivate would depend upon the location, and the purpose for which I wished to raise them. If in the vicinity of a good local market, and wished to go to market during the season, with vegetables, I would plant a portion of them for early apples which would command a good price,—apples good for culinary purposes, and to sell in the shops. If at a distance from a regular market, I would take some such apple as the Hubbardston and the Baldwin, which can be picked and sold in the mass.

A soil which is in a good condition to produce a good crop of corn, will also make apple trees grow. On old ground I would cultivate the trees for a series of years, and be careful about mangling the roots while doing so. When planting a young tree I take it first in my left hand, and with a sharp knife in my right, trim every root that has been cut off with the spade, or broken, because such roots are rough, and need smoothing, or they will, when buried in the ground, decay somewhat, on account of the bruise. But if you give the root a cut from the under side, and outward, it leaves it in such shape that the fibres will afterwards strike outward, as sure as the tree grows. This is necessary, to sustain the growing tree and keep it upright. If trees are leaning, they are unsightly, and it is more difficult to cultivate among them, and such trees are more liable to be uprooted, when in full foliage, and loaded with fruit.

I recently had occasion to visit the Worcester South Agricultural Society. I spent a night with a Mr. Hammett, I think, an elderly gentleman, who is earnest in fruit culture. His orchard land was full of rocks, and he had put down his trees wherever he could get one growing. He kept a flock of sheep among his trees, and his orchard did look really fine. It was the best I saw. I have had no experience with sheep among trees, but I would not recommend putting sheep among young trees. But I have no doubt the sheep were a benefit to his orchard, under the circumstances.

In my nursery, I let my trees grow to a sufficient height for the limbs, if I can, the first year. I wish them to grow six feet, and then they will be in a better condition to grow into the shape you desire. If not, I cut them back. I generally cut the tops off about the height of my nose or chin. I wish to have them so high that when I plough, a yoke of cattle can pass beneath them.

A MEMBER.—Would you recommend that because it is better for the apple, or more convenient for yourself?

MR. CLEMENT.—Because it is more convenient for myself. I would not recommend planting trees nearer together than forty feet. If the branches are lower than five feet from the ground, they will come to the ground when loaded with fruit.

The Northern Spy generally grows very upright, naturally, and with long, slender branches; but if you do not trim that the branches will come to the ground when full of fruit. The apple which we call the Hunt Russet is another of the same kind. It is a good apple, of medium size, oblong, and narrowing toward the eye. It is much like the Northern Spy, and should be pruned pretty high.

I am well aware that it is much more convenient to pick apples standing on the ground, as a man can pick three times as fast from the ground as when standing in the tree, or on a ladder. When planting the trees, I take pains to place the earth carefully around the roots with my hands. It is of no use for a man to think of farming if he is afraid of the dirt. If he is a little squeamish about dirtying his hands, I would recommend to him to try some other occupation. I would set the tree in the ground just about as deep as it grew in the nursery. But if I had taken the tree from a dry soil, where the roots had penetrated deep, I would plant a little deeper than it grew originally. I do not like wet soil for a tree of any kind. Water must not stand about the roots of trees.

The Baldwin is a free grower, and a little liable to winter-kill, especially if forced to grow late in autumn. When I have removed Baldwin trees to a rich soil I have often lost them. Other varieties are more hardy. The Blue Pearmain is as difficult to kill as a thorn bush. In the nursery, that kind of tree throws it roots deeper and in a different form from any other tree. The roots are numerous, and close around the tree, quite different in that respect from other trees.

I press the earth gently about the roots; and I would not stake a tree unless absolutely necessary. I would rather lay a little mulch down, and put some flat stones on that. If planted in autumn, I would raise the ridge of earth around the roots so as to keep the tree steady, and in the spring spread the earth away. There is no difficulty in raising an orchard, under such circumstances, or in making it profitable. On some farms I would not recommend any attempt to raise an orchard, because the land is not suitable, though every man should try to raise a few. A warm sandy soil is unsuitable for the apple, in my opinion. On Townsend Plains, the people have tried to raise apples, but the trees fail, and they will fail. Apples will cost more than they are worth, raised there.

Mr. EARLE.—How is it with the Porter apple?

Mr. CLEMENT.—That is an exception. It will grow where other apples would not.

Mr. EARLE.—Will not the Roxbury Russet grow in a sandy soil?

Mr. CLEMENT.—The Roxbury Russet grows best in a strong soil. I look upon the borer as the greatest enemy to the apple. We have a great deal of difficulty in keeping the borers in check, so as to raise any trees at all. In our nurseries we have to examine our trees every year. We do it in August. We find the young borer just under the bark, and entering it, in July and August. When the weather has been dry for a short time, we find a little pile of chips that the borer has thrown out. We cut them out with a knife. The best remedy is to encourage the birds. I was much interested in Mr. Samuels' address yesterday, particularly his allusion to the woodpecker. I have seen that bird pecking around where a borer is at work, and run his tongue in and hook him out.

Mr. DAVIS.—Harpoon him.

Mr. CLEMENT.—Yes, that is it exactly; and they do it pretty lively sometimes. But these birds are becoming scarce. I wish to encourage the woodpeckers, and bluebirds, and pe-wees, and other birds, to come into my orchard and live there. Nothing provokes me so much as to see boys, and, much more, men, going around with guns and shooting the birds. The pe-wees, or Phebes, come every year to my barn and make their nests there. They take all the flies and millers they can find. The number they destroy is incalculable, for they do it very rapidly.

In answer to a question, Mr. Clement said he had never seen the canker-worm in his locality. There were a few in the town of Dracut last season.

Prof. CHADBOURNE.—I would like to ask about the woodpecker destroying the borer. I have never seen the woodpecker working right down near the ground, where we find the borer. The apple-tree borer, which does so much mischief, pierces the tree close to the ground, as it were, between wind and water. I have never seen any evidence that woodpeckers destroy that kind of borer.

Mr. Clement.—I have seen it. And I have seen the borer under the smooth bark up among the branches; and I have seen where the birds have pecked them out.

Mr. Davis.—Is not the borer the same worm that cuts the limbs from the oak trees?

Mr. Clement.—No, that is done by another insect altogether. Neither is the flat-headed worm, found under the bark of rotten wood, the borer. Sometimes this flat-headed worm is found under the bark of the apple-tree, where the bark has been killed by the heat of the sun. Sometimes the sun shines so hotly on a portion of the tree newly exposed to its rays, as to kill the bark. I always take some of the branches, which I have sawed off when grafting trees or trimming them, and fasten them on the limbs that are in danger of being sunburnt.

Mr. Tidd.—In preparing the roots, when setting out trees, do you cut off the tap-root?

Mr. Clement.—We always cut it. We have many trees, though, that do not seem to have any tap-root. Much depends upon the soil where trees grow, whether they have a tap-root or not. Seedlings will almost invariably run right down for one year. They have few fibres the first year.

Mr. Tidd.—Do you shorten in the branches of the tree when it is set out?

Mr. Clement.—I do. I should cut off half the last year's growth, if it made a great growth the year before, depending somewhat on the shape of the tree.

Mr. Tidd.—In heading in a tree, would you have any reference to the number of roots?

Mr. Clement.—Yes, always. In digging up nursery trees we frequently find one not well rooted, and lay it aside and head it in. When planting a tree, all the branches which would cross each other while growing should be cut off. If this matter is attended to, it will scarcely ever be necessary to cut off any large branches, which should always be avoided.

Mr. Capen.—Would you prune an apple orchard annually, as we do the grape?

Mr. Clement.—I think it well to prune an orchard a little every year.

Mr. Earle.—Would you recommend the cutting in of the apple in the same manner as we do the grape and the peach, or for any purpose except to keep the shape of the tree good?

Mr. Clement.—I would not. Some cut out the middle branches of a tree to let the sun in; but the next heavy crop of apples will swing the limbs to the ground, and leave the middle of the tree an open space.

Mr. Barnard.—Would you cultivate the ground of an orchard?

Mr. Clement.—I would cultivate, especially on old lands, being careful not to injure the roots. Cultivation lays the earth open to the sun, and atmosphere, and rain. Even a little circle dug around a tree, no larger than a wagon-wheel, is better than nothing.

Mr. Davis.—From your own experience, do we need more legislation to protect our lands and forests from boys who carry guns?

Mr. Clement.—I think we need something of the kind. I alluded, in an article which I prepared for the "Boston Daily Advertiser," last winter, to the matter of legislation with reference to caterpillars. I have a neighbor, having lands on either side of me, who does not kill his caterpillars. And though I take especial pains to kill all I can find on my trees, and spend days in doing it, when the worms leave my neighbor's trees they come all over my place, and the next year my trees are covered with caterpillars. I think that is a case for legislation, and that farmers should be compelled to kill the caterpillars on their own trees, or cut down the trees.

Mr. Davis.—It is certainly a great annoyance to a farmer who wishes to protect birds, to have clerks and others, who wish to take a walk, passing through his forests and shooting such birds as he wishes to protect. He would rather like to see them walk through his lands if they will let the birds alone. I think we want a law, that if a notice is put up, saying, "No one may shoot birds on this land," a heavy fine may be the penalty of the violation; and the carrying of a gun over the ground, or a bird-bag, should be considered also a violation. During these dry times I have had my forests set on fire, and suffered many dollars damage from careless shooting.

Mr. Hadwen, of Worcester.—I have thought some legislation, empowering towns to employ a man to kill the caterpillars, would be well. If I kill the worms on my place they may come on again from the lands of another person. I think the birds should be protected, for they do a great deal of good.

Col. P. W. Taft, of Worcester.—I am a great friend to the birds, and love to see justice done them. While in the State of New York, a few years' since, I spent some time in a place where there was much good fruit. I noticed many woodpeckers there putting their long bills into the apple-trees. I saw men and boys shooting the birds, and I asked the cause. They said the birds were destroying the trees. I told them they were doing the birds great injustice ; that there were no perforations made by the birds where there was not a worm. When we took pains to examine we found it so.

When I was a boy I was taught to shoot them. Science had not developed the fact that they were searching for the enemies of the tree. Now the woodpeckers have nearly all deserted us. I am sorry, for I think they are a great benefit to the orchards. When they were plenty, and were not molested, the orchards were almost entirely free from caterpillars and canker-worms. I remember one orchard of about ten acres that had but few old trees in it, and only a few without holes made in the bark by the woodpeckers. These trees had the largest and finest fruit I ever saw. All we ever did to those trees was to dig around them a little and throw down a few twigs and some pumice from the cider-mill, for mulching.

There has been much said about the best time for transplanting trees. A few years ago I had about seventy-five or a hundred fruit trees in bearing which I wished to remove. I was obliged to remove them in the month of October. A neighbor also had some trees to remove. He decided that he would remove his permanently in the fall. I decided that I would remove mine, dig a trench and heal them in. I did so, and the next May I set them out. Many of the trees had blossomed before I set them. But the fruit ripened the same year. My neighbor lost nearly every tree which he set out in autumn. Still, I am not prepared to say whether the spring or autumn is the better time for transplanting.

Mr. Earle.—I wish to say a word or two with regard to the raising of seedlings. I believe we have yet to raise the best grape. The Concord is a good stretch towards it. But we want a grape which shall combine the good qualities of the Iona with the thriftiness of the Concord, and as early as the Hartford Prolific, and with as fine looking fruit as the Concord. We shall get it; but we shall have to raise a good many seedlings before we accomplish it.

The theory of Van Mons was alluded to as first suggesting this idea of raising seedlings. But I am no believer in that theory. He assumes that in order to get good fruit we have got to go back to the original—the wild grape, and the wild apple, and the wild pear—and bring them up to the desired standard. I think that is losing the benefit of the cultivation of centuries. I believe that, in a few generations, you may get trees that will, perhaps, equal those which we now have. But why go through that process? Neither the apple, pear, nor grape changes in its natural condition. It does not produce seedlings that are better or different from itself. It is cultivation only that brings about the change. This may be exemplified more readily, perhaps, by referring to the flowers that are cultivated. Take, for instance, the violets. There was one particular species introduced from the Cape of Good Hope, that, until it was cultivated highly, always produced the same. But finally, in the city of Ghent, in the Netherlands, they produced a seedling which was a great improvement. When you have once changed a plant from its natural condition, you may go on to improve by *cultivation*. It is by cultivation that you produce a *tendency* to something better. I had a variety of bean which I called the olive colored cranberry bean. I found, one year, that a different bean had grown from it. I took sixty or seventy beans from it, and planted them by themselves the next year, and from them I got as many different varieties as there were beans that I planted. There were bush and poll beans of all varieties. Unfortunately, I was unable to pursue the experiment any further. Therefore, I lay this down as a fundamental principle: If you want to get good fruit, take from a variety already under cultivation, and then take the best specimens of the fruit. The success of this plan, as compared with the other, will show, I think, that the principle which I lay down is correct.

Van Mons, after his experiment of raising seedlings two or three successive generations, planted and raised sixty thousand seedlings from the third or fourth generation. And from all of them we know how few he got which were really valuable.

Whereas, those who have taken the other course in France and in Belgium, have, with comparatively few efforts, raised more standard varieties than were produced by Van Mons. I inquired of Augustus Dana, who raised many as good pears as the best of Van Mons'. He always took the best kind of fruit, and the best specimens he could get. I asked him if he had raised any considerable number, in order to get the seedlings which he had put into the market, and he said he had not. I raised about fifty seedling pear trees, about one-half of which have fruited; and out of that number—not more than twenty-five trees—I have succeeded in getting five or six varieties that will compare with the best varieties that ever Van Mons raised.

Mr. Bull.—I want to say a word with regard to Van Mons' theory. I think the remark of my friend from Worcester confirms Van Mons' theory. It is on record that Du Hamel did, for fifty years, plant the seeds of the best pears, without getting any that were not execrable. Van Mons took the wild pear and infused vigor. Others grew seedlings from them, and improvements took place. Possibly, hybridization had some influence. And from those best pears brought to this country, Mr. Dana had his success, and Mr. Earle had his. But since you had no good grapes in this country, there was no alternative but to take the native grape. Now, I ask if the success we have met with in so short a time has not proved the theory of Van Mons, that nature has laid up the vigor, and that men, by cultivation, obtain the good qualities?

Our friend (Mr. Earle,) wants a better grape. I have seventeen grapes, every one of which is better than the Concord. I don't think there is a seedling in this country from the choice old pears that Van Mons experimented with.

Mr. Earle.—I agree that we had no other but the native grape to start from. But we now have those that have been cultivated; and I say, take seedlings from the best we have, bring them to the highest point that you can, and from these you can take seeds and improve still further. But do not go back.

Mr. Perkins.—In my observations, two years ago, as I was on a committee for visiting farms in Berkshire County, I will say that the orchard to which we awarded the premium was one of five years' growth that had been enriched. But the trees were banked in the fall, and the earth removed in the spring.

But I rose more particularly to offer a motion that this Board tender a vote of thanks to the authorities of the city of Worcester, for the gratuitous use of this hall for the purpose of our meetings.

The motion was unanimously adopted.

The PRESIDENT.—As the discussion of this afternoon will close our discussions, I wish to say that the cultivation of fruit is too little estimated. I believe that we can raise, in Massachusetts, all the fruits of the different kinds that we need for consumption in Massachusetts, if we go to work understandingly to do it. We have a variety of soils and slopes adapted to all the different kinds of fruits that are necessary. The discussion has been chiefly upon grapes, and little has been said about other fruits. This fall I visited some farms in the south part of Berkshire County. I visited one gentleman who resides under a bluff that rises sixty or eighty feet above his house. Upon that entire slope grapes were growing, and running up the sides of granite rocks. A kind of frame was made of poles, which kept the vines about ten inches from the surface of the rock. Here, between the poles and the rocks, hung hundreds of clusters of grapes. The question occurred to me, which did most in the production of the grape, the soil or the rock? The soil furnished the nutriment, and the rocks became warm in the day, and retained their warmth during the night, and did much toward ripening the grapes. How many places have we where we can furnish ourselves with grapes without any expense! We all have gardens which we desire to cultivate to the utmost possible advantage.

The President expressed the hope that all who had listened to the discussions and lectures at this meeting of the Board, might be able to apply the hints received with profit.

The meeting the adjourned till 7 1-2 o'clock in the evening.

THURSDAY EVENING.

The Board met, agreeably to adjournment.

Prof. JOHN BASCOM, of Williams College, was introduced as the lecturer of the evening, and spoke substantially as follows:

Gentlemen of the Board of Agriculture,—I should not appear before you without a full manuscript, did my eyes allow me to read it in the evening. I must, therefore, crave your allowance for any defects that the form of my remarks may present. My subject is

THE POLITICAL ECONOMY OF AGRICULTURE.

Political economy treats of the principles on which all production depends, while it leaves to each branch, as to the art of agriculture, those specific rules by which its own ends are to be reached.

I invite your attention to the law of profits in manufactures as contrasted with that of agriculture. It is this: With each increase of capital there tends to be a yet greater increase of profits. This arises from a variety of reasons, some of which I will mention. As capital enlarges, it secures a more thorough command of machinery. We are here speaking of a simple increase of capital, without increase of skill. Larger capitals can avail themselves perfectly of the best machinery and of the best skill. They can also secure the fruits of division of labor, applying the least skilled labor to the ruder forms of production, and more skilled labor to the more difficult forms. A third reason for this growth of profits is, that the several processes of manufacture can go on at the same time, mutually sustaining each other. In the carriage shop, the work in wire and wood, the painting and upholstery, can proceed together, and each with the needful quota of hands. It is often a matter of great convenience and economy that the difficult parts of the process should be carried on within the same building, and thus the several operations complete themselves readily and rapidly.

There can also be a more economical use of the material employed, so that much that would be lost in a small establishment, in a large one will be saved. In the lumber business, for instance, that which cannot be used for boards may be sawed into laths, and in the variety of demand each log be cut according to its fitness, with highest economy of value.

A further reason is, that as capital increases, there is a better command of the market, both in buying and selling. He who sells largely has an advantage over him who has but little to sell; so, also, in buying. He may dispense with a middle man, or secure his services at a less per cent. on the amount bought or sold.

As capital increases, all the aid that is incidentally necessary to the manufacture can be commanded. Skilled machinists will be found at hand, so that if any portion of the machinery is broken, it can be easily repaired. But if the establishment is a small one, at a distance from the centres of production, it may be days before such a difficulty can be remedied.

For these and other reasons, it appears that the law of manufactures is, that as the capital increases, not merely the profits, but the ratio of profits to capital, increases.

When we come to agriculture, we meet very different results. The law of agricultural labor is the reverse of this; that as labor and capital increase, the profits tend to diminish. Bear in mind, that, with this growth of capital, there is no growth of skill contemplated, and no new methods are introduced. If, then, we go on to enlarge our capital, on the old basis of skill, our returns tend to diminish: the ratio becomes more unfavorable between returns and expenditure.

First, suppose we are working upon twenty acres of land, and employing the methods of cultivation at the time common. We may, for a grain crop, plough twice, if that is deemed best, and harrow three times. If, now, we increase our labor, and plough three and harrow four times, we may enlarge our returns, but not as rapidly as we have enlarged our toil. If we could thus secure our gains, we might go on and plough four and five, and harrow six and seven times. But though our profits may thus grow, they will certainly not grow as rapidly as our labor.

Suppose, then, we add to our twenty acres twenty more, and apply our culture to these also. We then work with no new advantage, and with this disadvantage, that our field of labor is more distant, our manure to be carried farther, and our returns to be brought farther—a small matter on so small a farm, but one of great importance on one of two or three hundred acres.

If a farmer increases the size of his farm to any great extent, he establishes, in fact, two farms, as these large operations cannot be carried on with ease from one centre. The difficulties of extended agriculture, maintained from one point, with one set of buildings, so increase, that inevitably the area under cultivation is divided and sub-divided into convenient farms, a division attended with the loss of that complete oversight and perfect management on the part of the owner, so influential in securing a good return. Within a few square rods a half million of capital may be gathered in a mechanical employment; in farming it must extend itself over almost as many square miles. Thus, through the loss of care and supervision, the law of agriculture becomes the reverse of that of manufacture.

Apparent exceptions existed under the slave system, where, with large plantations, there were large profits. But that kind of agriculture exhausted the soil, and destroyed itself. So, in the West Indies, there seems to be an exception, but it is largely due to the fact that an element of manufactures enters into the production of sugar, and heavy expenditures are made necessary for apparatus. In England, where extensive tracts are cultivated under the management of a single person, agriculture is usually attended with great degradation on the part of the laborers, and the returns from a large area are gathered into the hands of very few.

A single family may, indeed, secure the means of luxury from extended possession, but this fact does not settle the form of cultivation desirable for the community, and capable of well rewarding all its agents. Any business may be made profitable if we oppress, with sufficient rigor, its subordinates. The inquiry of present interest is, how shall farming make the best, the most adequate return to the actual laborer; how yield the largest aggregate returns?

The first conclusion to be drawn from these contrasted laws is, that agriculture is better adapted to small capitals than manufactures, as the manufacturer's profits will increase with capital, whereas the profits of the farmer will not. A second conclusion from this law is, that the farmer must prosper chiefly by his wits. The moment he ceases to devise new and better methods, his difficulties begin to multiply. He can then, at best, only remain stationary. If, therefore, the farmer would progress, would secure greater advantages from his labor, he must improve his methods; more thoroughly drain his soil, more completely break it up, furnish new manures, or deal with the old ones in new ways. In this manner, he gains power over nature. So long, however, as he strives to advance by simple, naked work—mere play of muscle—nature bestows on him less and less. To overcome the obstacles she opposes, more and more constant thought must be called forth on the farm than in the manufactory.

Manufacturers may multiply their profits with their old machinery, in the old way, but the farmer must invent new tools, and new methods, if he would prosper amid the difficulties under which he is placed.

The third conclusion, and the one to which we would draw attention more especially, is, that good farming tends to the condensation of labor, not to its diffusion. It tends to gather in labor upon a small surface. The same amount of labor is more profitably expended on a small than a large area. We see this in connection with the second deduction, that the farmer must advance by wit, and not by work alone. Meeting with increasing disadvantages as he enlarges his land, he will find, as he brings more thought to his task, that he must expend his labor on the old ground, rather than on new.

There can scarcely be any method devised of permanently enlarging the fertility of land, of making it a more productive agent, and one more easily handled, that does not, at the outset, call for extra labor. Take draining for an illustration. Much cannot be done at this on a farm of two hundred and fifty acres, worked by two laborers. The cold, wet, unpleasant soil must be left to yield what it will. Let the owner resolve to drain thoroughly, and a few fields must then be taken in hand, to the abandonment of the remainder.

So, too, the cultivation of a crop, especially the more profitable crops on land brought into good condition, will require greater attention and completeness of treatment in proportion as we are determined to reach the highest results. We shall omit part of our task, that we may do the remainder as it ought to be done.

We see this also in connection with the use of manures. As agriculture progresses, manures become more and more essential. The farmer raises larger quantities of produce on the same ground ; he finds, therefore, that he has not enough fertilizers for two hundred acres, and that he must use them all on forty. This discovery, that he must manure more thoroughly to get the reward of his labor, will again tend to concentration.

As civilization has advanced, there has been a constant condensation of labor. The savages who occupied the country before us, were, with inconsiderable numbers, spread over the State, and, in gaining their living by hunting, required the whole area. As a step above savage life, we have nomadic life, requiring (in the rearing of flocks,) more development of the power of the soil; then the cultivation of grains, calling for still more ; and, at length, the raising of vegetables and fruits, with a large population gathered on a small area, necessitating a still further concentration of labor. Thus, in the growth of agriculture, has labor from the beginning been more and more gathered on a small area.

Compare, also, profits. If we were told that the returns of a single acre were a thousand dollars, we might readily believe that profits were a hundred per cent. But if we were told that that thousand dollars came from labor spread over two hundred acres, we should know that the rate of profit could hardly be more than six per cent.

It may be said, that this principle is readily admitted with regard to good soils in the valleys, but that our mountain farms must of necessity be large, and that these furnish no opportunity for this condensed labor. I think this is only partially true, and that so far as these mountain farmers engage in agriculture at all, and break up the ground, it is well worth their while to cultivate a few fields thoroughly, to the exclusion of others.

There is also an opportunity for concentration of labor, by reserving the forest as forest, without the waste of cattle ; by clearing the pasture of bushes, bringing it out to the sunlight; by making meadow yield to its fullest capacity, and by giving the ground about the house the benefit of faithful tillage.

I draw attention to the connection of this principle with progress in farming. The man who has most concentrated his labor, will be most ready to receive improvements, and will derive the greatest advantage from them. A mountain farmer may have three fields, the labor already expended on which may be expressed by six, by three, by one. Suppose we introduce a new machine—as the reaper and mower. On which field is he to find for it the greatest use ? On that represented by number six, certainly. This field is thoroughly drained, the bushes cut, and the rocks dug out, and the machine may move smoothly over every part. But when he comes to the field represented by number three, there are found many remaining obstacles, and his machine, if used, moves with much friction, worrying both driver and team. When he comes to the field represented by number one, he finds no use for his implement, and is no better off in reference to this field, than if there had been no such invention.

So, in the application of manures. From which field will he derive the greatest advantage from these? Plainly, on the first, whose soil can be so pulverized that the manure will show its full power, and the farmer reap the entire advantage of its presence. On the field represented by number six, he can also raise good root crops. On the field represented by number three, he can scarcely raise any; and on the field represented by number one, not a root. The land, therefore, on which the most work has been concentrated, is best prepared for the reception of any better method of culture which may arise. Herein is a confirmation of the law, that "To him that hath, shall be given, and he shall have more abundance."

To the man on the unsubdued farm, nothing is given, because he has nothing; no field being ready for the advantages that offer.

I wish to illustrate this truth again by the relation of concentrated farming to manufactures. Take, for instance, the article of meats: If we are to sell our meats to full profits, we must have a market near at hand. If we are situated as the farmers of northern Vermont, whose cattle are taken from the pasture, and driven to the neighborhood of a city like New York, and there stall-fed, we lose a great part of the profit which we would make if we stall-fed them ourselves, and sold them near home. If they have been fattened by ourselves, we can return their food to our land in the form of manure. We increase thus our capital—the value of our land. If we have manufactories near by, we can sell all perishable kinds of meats readily, and multiply our profits in this direction.

So it is, also, as regards vegetables and fruits. Little can be done in raising these, except in the neighborhood of villages. Near a manufacturing community, we can so multiply crops that an acre shall produce in value a thousand dollars. With no marketmen between us and the buyer, our returns come quickly, and we have every opportunity for large profit.

Another advantage of concentrated farming in a large population is, that we may have a much better return of manure; and thus the farm that feeds the village is itself fed by the village. If our products are all carried off so far that there is little opportunity to obtain anything in the form of night soil for the farm, our land will be steadily exhausted. Such a policy cannot be finally successful. The village enables us readily to maintain the farm, while the farm, in return, maintains it. Thus our soil, often impoverished by poor culture, especially requires the aid that comes from manufactures.

This condensed farming is also called for by the consideration of economy; indeed, it is economy which chiefly demands it. Take a field of cold clay soil, that the team turns with difficulty, the unbroken sods falling over completely, and settling after each rain as hard as before. There is great labor in breaking up such a field, as compared with one that has been cultivated a long time, and, by draining, reduced to a light loam. On the one ground, the grain comes up feeble and thin; on the other, evenly, and with great certainty of a full yield.

A chief reason why farmers are so remiss in doing all that is necessary for the complete success of their labors—losing half the result by omitting a third of the toil, endangering the entire crop by a little negligence in preparation or protection—is, that they have adopted a wrong method; that they are more ambitious of large than of good farms, and lay upon themselves burdens which they cannot easily or securely carry. They have no time for that early attention and careful supervision which economy requires. They suffer all the accidents of things left to themselves. Fences are broken down, and crops and cows injured. Diseases gain ground in the flock, and sadly reduce its profits; orchards are planted and left to the grub, and to be worried and broken in the winter and spring by cattle, that lose by their liberty; tools, wagons and sleighs shrink in the sun, swell in the rain, and in use, suddenly give way, to the arrest of labor, and the damage of temper and property.

On the river of chances, the overtaxed and negligent farmer is always rowing up the stream, doing with loss, and at the hardest, what nature, a little more skilfully and patiently managed, would spontaneously do for him. As contrasted with other men, farmers, while often penurious, are also most uneconomical and wasteful. A few leading crops are relied on, to the neglect of the many sources of minor and incidental gain. Fruit, which makes a large claim on foresight and care, and little on labor; which, once secured, gives abundant and easy returns, suffers very general neglect. Manure, whose methods of acquisition need to be constant, thorough and complete; upon whose presence the success of other labor so much depends; is generally through a want of providence, increased by no compost heap, no careful accumulation, while one-half or two-thirds of what nature forces upon the farmer is lost by evaporation, drainage, and neglect.

Cattle and sheep, in the cold winds and storms of autumn and early winter, are neglected, allowed to feed on frost-bitten meadows, giving the appearance of fulness and flesh without the fact, and stripping the soil of its just protection and nutriment.

The ways of waste on a farm are great and innumerable, and the farmer, made negligent and inattentive by over-labor, by a hasty, slovenly, and inadequate method, will stumble upon most of them. A ruinous, leaky, rat-infested barn, fretting lean cattle with cold winds from every quarter, will, with one stroke of loss, reduce profits by half.

The mechanic would be utterly ruined by a negligence familiar to many, if not most, farmers.

Another mischief arising from this diffusion of overtasked labor, is the entire neglect to which it leads, of taste and beauty.

Farmers are the most fortunate class in the materials and and opportunities at their disposal for making the home snug and attractive. That which involves heavy expenditure in others, comes to them as a matter of course in their very business. Yards, trees, fields, forests, meadows, all the means of natural adornment, are at their disposal. At no point does mental show its superiority over mere physical labor more markedly than at this. The exercise of a little taste in the construction of buildings, in the planting of trees and arrangement of grounds, will, with scarcely any exertion, fascinate the eye, impart an impression of comfort, and greatly enhance the value of a farm.

Good judgment and good taste bring a high price, and, at the same time, much more than compensate any labor they impose by the unusual pleasure which attends their exercise.

Good, compact farming is closely allied to beauty. It loves a thifty orchard, tidy and secure barns, a cellar wherein to hide and save manures, well-kept fences, a safe storage of tools, and vigorous growth everywhere. It can hardly fail of adornment, so careful is it to keep everything at its best estate; every tree fruitful, every animal growing, every field fertile, every building sound and snug. The least taste with these essentials of order must carry comfort into elegance, and add to the useful, the graceful.

Compact farming cultivates that perfection and completeness of method, that attention to the less as well as the greater, that entire use and husbandry of every resource, which is closely allied to taste, and prepares the way for its exercise. The farmer may have most beautiful and ample grounds without departing from a stern estimate of the direct value and sober utility of all that he does.

I have now reached a point to me more interesting than any other: the influence of good farming upon character. I trust we shall not soon come to that condition of things in which the landholder, is the landlord. I speak for those who do the work of the farm. They will increase in worth of character just in proportion as they learn to concentrate their labor, and bring to every operation the most patient and thorough thought.

We cannot safely neglect the interests of field-hands. No class has suffered more wrong in the past. The bitterest, most obdurate forms of slavery have frequently fallen to their lot. Engaged in rough, hard labor, which admits of coarse and careless execution, separated from each other and made incapable of combination, removed from the observation of men and that general intercourse which quickens and develops the mind, these laborers have been, even to our own time and country, especially unable to protect themselves, and secure the full advantage of their toil.

That compact, circumscribed farming, which furnishes the largest number of freeholds, it is evident, affords the best opportunity to all to aspire to ownership, and the strongest motives to the development of an independent, self-reliant manhood. It breaks down a distinction so liable to spring up between the holder of land and the workmen on it, and maintains that truly democratic form of society which stimulates intelligence and rewards industry.

The path of progress is open to all; mind gains ground on muscle, and a sense of strength and responsibility is imparted by the success which attends exertion.

As the citizen is more valuable than the producer, the man than the laborer, that farming is of most worth to the State, which at once transforms the barren soil into fertile fields, and the clownish day-laborer into a thriving free-holder.

As patriots, members of a State chiefly honorable for its intelligence and virtue, we should regard every other consideration as light and trivial compared with the development of the manhood of our men—the strength and honor of those working classes, who have borne us up on strong, willing hands through the dangers of the past, as they shall through those of the future.

In no part of this continent is there a more immediate and favorable union of all interests than here. Manufacture quickens agriculture, and agriculture supports manufacture. From east to west, through the whole length of our borders, the cities and crowding villages call for that varied garden produce, that variety of grains, fruits and vegetables, which makes every foot of land available, and prepares the way for the diligence of many owners.

Thus, while beauty joins itself to utility in our fields and home grounds, virtue shall add itself to intelligence in the character of our citizens, and we be doubly blessed with lands that yield their increase, and patriot hearts that give their strength to the Commonwealth.

The PRESIDENT.—Gentlemen of the Board of Agriculture,—I would remind you that, with the close of this session, our meeting closes. You have had, since Tuesday noon, some twenty hours, and I must say that I have never known so much time so profitably and so fully occupied as on this occasion. Now that we are about to go, let us carry home the information we have received and disseminate it among the farmers around us. For it is here that we get ideas that can be made practical in the communities in which we live.

I expect to meet a farmer's club Monday evening, and I shall be pleased and gratified to make such a report as I can, and which I hope will incite them to renewed efforts in the cause of agriculture.

On motion of Mr. THOMPSON, of Nantucket, a unanimous vote of thanks was tendered to Prof. Bascom, for his able, comprehensive and instructive lecture this evening.

Hon. D. WALDO LINCOLN, of Worcester.—I had the pleasure of listening to the admirable address of Hon. E. W. Bull, of Concord, this morning, and I move that the thanks of the Board be presented to Hon. E. W. Bull, for the able address delivered by him this morning, on grape culture.

Unanimously adopted.

The Board then adjourned, *sine die.*

ANNUAL MEETING AT BOSTON.

The State Board of Agriculture met at the office of the Secretary, at the State House, on Thursday, the 1st day of February, at 12 o'clock. Present, Messrs. Adams, Bull, Chadbourne, Clement, Davis, Huntington, Homer, Johnson, Loring, Moore, Perkins, Sewall, Smith, of Middlefield, Smith, of Sunderland, Taft, Tidd and Thompson.

In the absence of His Excellency, Mr. Davis was requested to preside, and accordingly took the chair.

The first day was chiefly occupied in the reception of the reports of delegates appointed to attend and report upon the exhibitions of the County Agricultural Societies.

These reports will be found on a subsequent page.

On Friday, the 2d instant, the attendance being the same as on Thursday, with the addition of Messrs. Cleaveland, Hubbard, Garfield, Keith and Stedman, the reports upon special subjects being in order, an essay was presented on

MANURES AND THEIR APPLICATION.

BY PHINEAS STEDMAN.

This subject is of superlative importance to every tiller of the soil; its thorough comprehension the key-note to success.

It is said that in England nothing is lost which can be converted into manure. How different is the case with us, and what a pleasing change would be wrought in the aspect of our agriculture, were this principle of the mother country adopted and carried into practice.

It should be an object of the first importance with every farmer to procure and retain, in the best possible manner, all the fertilizers, both animal and vegetable, which can be obtained upon his farm. These are to his growing crops what hay and forage are to his cattle—the food which is to nourish and perfect their growth.

I cannot expect, in this essay, to enumerate all the sources of fertility, or to describe minutely the best methods of retaining their valuable qualities, and of applying them in such a manner as best to promote the fertility of the soil, and furnish food for the growing crop. With us the chief source of supply is the excrements of our domestic animals. I say chief source, for while these form the base, they may be augmented, and their value greatly increased, by the addition of litter and various waste substances, which are always at hand, in greater or less abundance, upon every farm.

Among the improvements in agriculture of the present time, we may notice an increased interest and attention to the subject of manures. Yet how much that is valuable is allowed to pass beyond our reach, or is lost, practically, by not being judiciously applied. Many farmers, who exercise some care not to lose the solid portion of the manure from their stables, yet make no provision for absorbing and preserving the liquid portion.

It has been often said, and I think with truth, that the liquid excrements, from most of our domestic animals, are of no less value than the solid. What an immense loss, then, is annually incurred by allowing, as many do, the larger portion of the former to descend into the earth beneath the cattle stables, or be carried away and dissipated by exposure to rain and sunshine. Some have advocated applying the liquid manure separately; but with us, I am persuaded, such a course is unwise. In order to be preserved and used to the best advantage, the liquid and solid portions should be combined. This appears evident from the difference in their composition, and unless thus applied, we are liable to give to the crop a surplus of some of the necessary fertilizing ingredients, while there is a deficiency of others, no less important.

Another advantage secured in their combination is, a more equal and proper decomposition. The urine, containing about twice as much ammonia as the solid, causes rapid fermentation, and consequent decomposition. When the two are united, the whole mass is more readily brought into the proper state to furnish nutriment for the growing crop.

The question, then, of practical importance to every farmer, is, How shall I make upon my farm the largest amount of valuable manure, and how shall it be treated, to attain to the fullest extent, its value as food for plants? If it were practicable, I would say, let it be applied to the soil while in its recent state. As this cannot always be done, we must adopt some method of retaining a portion of it for future use.

The plan I have adopted, and recommend as most effective and economical, is, to provide a cellar below the stable, into which the cattle droppings and litter shall be deposited daily, with the frequent addition of muck, loam, or sand, sufficient to absorb all the surplus moisture. This, with keeping swine upon it, will prevent its too rapid fermentation, and preserve it most nearly from loss.

When a cellar cannot conveniently be had, let a water-tight trench be constructed immediately behind the cattle, in which some absorbent, sufficient to retain all the urine, should be placed, and with the cattle droppings, be removed daily to a covered shed. The principal objection to this latter course is the additional labor of removing the earth, or other absorbent.

When cattle are allowed to stand upon a ground floor, and the manure is removed only occasionally, the floor should be covered with a thick coating of earth, to be removed, from time to time, and its place be supplied with fresh earth.

Manure should never be exposed to the influence of sun or rain (particularly the latter,) until it is distributed upon the land. By suffering such exposure, its most valuable salts, being soluble in water, are dissolved, and either carried away with the surface water, or descend into the soil. In proof of this, we need only to notice the effect where a heap of manure has lain during several rains. The visible portion of the manure may be entirely removed from that spot, yet the succeeding crops will indicate most clearly that a larger portion of its value was leached out, and carried into the soil below, than was applied to any other equal portion of the field.

I desire here to say a few words upon the importance and value of vegetable matter, in connection with the accumulation of the manure heap, and especially upon lands which have been materially exhausted of this element by successive cropping.

Striking examples of this defect are seen in the worn out lands of Virginia. The crops upon these lands have been stimulated by the use of guano alone, without the addition of vegetable matter, until the land has become so far exhausted of this element as to be incapable of producing crops. The same may be seen to some extent in most sections where an exhaustive course of cultivation has been long continued. To supply this want of vegetable matter, some recommend the ploughing in of crops, either green, or in a dry state. For this purpose, clover is, perhaps, superior to any other crop. But, where hay is in demand, even at a low price, I think it better economy to feed the crop, and return the manure to the land.

A large portion of the solid excrements of neat stock is vegetable matter. In the process of mastication, the hay has imparted to the animal a portion of its starch, albumen, &c., but the great bulk of the food which passes through as manure, is the finely divided woody fibre of the hay. By the process of digestion, it has been brought into a state to be more readily appropriated by the growing plant.

To show more conclusively the value of vegetable matter to the growing crop, and also the intrinsic value of urine, let me cite an experiment made by the late Arthur Young. He took five equal portions of a field, one portion of which he manured with dry cut straw; a second with an equal amount of straw soaked five hours in fresh urine; a third with straw soaked fifteen hours; a fourth with straw soaked three days; and to the fifth he applied nothing. The whole was tilled alike, and sown with grain. The product in grain, of the first, was thirty-nine, of the second, fifty, of the third, sixty-three, of the fourth, one hundred and twenty-six, and of the unmanured portion, nine.

In weight of grain and straw, the product of the several portions, in the order above named, were, one hundred, one hundred and twenty, one hundred and thirty, three hundred and forty-eight.

It should be borne in mind that while the increase in grain and straw by the application of dry straw was as two to one, the ratio of grain alone was as four to two, and also, that the portion treated with straw thoroughly soaked in urine produced both in grain and straw three times as much as that which received only straw.

I have thus far spoken only of the most common and abundant source of manurial supply. There are others which, though less abundant and imposing, are too valuable to be overlooked or neglected. One of these, and the one which is most commonly suffered to go entirely to waste, is the droppings from the domestic fowls.

How common it is for those who pass for good farmers to neglect to make any suitable provision for their poultry. They thus incur, to a large extent, the loss of that income which these invariably return when well cared for, and the still greater loss of their valuable manure; and this, too, while sending money abroad to purchase that which is so lavishly wasted at home.

Having occasion, some time since, to call upon a farmer of this class, I was informed that he had gone to the garden, which was some eighty rods distant. Not perceiving any satisfactory reason why the vegetable garden should be at such a distance, I expressed surprise, and was informed that it was to escape the depredations by the hens. Upon entering the barn I perceived that their most common roosting place was upon the front of the horse-manger, and their nightly droppings were *worse* than *wasted.*

This may be thought an extreme case; but has it not its counterpart upon many a homestead, where we have a right to expect better things?

From experience, I feel warranted in saying, that when properly fed and cared for, our domestic fowls not only cease to be a source of vexation and waste, but will yield a direct profit in eggs, and will also furnish a valuable auxiliary to our stock of fertilizers.

Having provided a suitable room for their occupancy, let the floor beneath the roost be supplied with a few inches of earth, or muck, and let a small quantity be added monthly during the season. Early in the spring the mass should be thoroughly mixed, with the addition of one bushel of plaster to ten of the compost. In this way one and one-half bushels of valuable compost may be obtained annually for each fowl kept, and of greater value than the same quantity of most commercial fertilizers.

The privy, too, may be made to add materially to the stock of fertilizers. Let it be made secure against the admission of surface-water, and be supplied, as occasion requires, with quicklime or other deodorizing material, and the whole be subsequently removed and composted. The night-wash from the chambers should be thrown upon the manure pile, or be poured upon partly filled casks of muck, or other absorbent, and the absorbent added occasionally, until the casks are filled, and the mass thoroughly saturated, and a valuable compost is formed.

I have omitted particular mention of the swine as auxiliaries in the way of furnishing a liberal supply of manure, not because they are less valuable, but only that I think they may be made most serviceable by having access to the manure of the horses or cattle, and to incorporate their own with that of the other stock.

The sheep-yards should be supplied, in autumn, with a liberal coating of earth, which in spring should be mixed with the manure and litter above it, and the whole be used for spring crops, and before it has undergone too much fermentation.

I have thus glanced at some of the most common and abundant sources of manurial supply, while I pass in silence others, such as bones, wood-ashes, sink-slops, decaying animals, and other refuse, none of which should be lost or neglected.

With regard to special fertilizers, or commercial manures, I have only to say, they doubtless possess real value, and often return in additional crop more than their cost. Yet, when we take into account the losses sustained from the purchase of impure and adulterated articles, together with the injury to the crop by injudicious application, it may well be doubted whether these have yet been to the farmer a source of profit.

We now pass to consider the application of manure. Here several distinct points demand attention, neither of which can be overlooked in practice without the liability of suffering loss. These are:

1st. Its condition. Shall it be applied fresh from the stall, or shall it be fermented?

2d. To what crops shall we apply it?

3d. At what season or seasons of the year?

4th. Whether upon the surface or at what depth beneath shall it be placed? And,

5th. Shall the application be *direct*, as in the hill for corn?

It is doubtless true in regard to each of these, as in most that relate to agriculture, that whatever rules may be adopted, they must necessarily be subject to many exceptions and modifications in practice, owing to difference in soils, seasons, location and other contingencies. Hence the necessity of careful observation, and also the importance of subjecting even scientific conclusions to the test of thorough and repeated practical experiment.

Believing that the main reliance for fertilizers should be the cattle-droppings, and other accumulations upon the farm premises, it is of these only that I speak.

I assume that farm-yard manure never possesses more of the elements of plant food than in its original, unfermented state; and that there is no laboratory so suitable and economical for its decomposition as the soil upon which it is used.

One reason for this appears in the fact, that if left exposed, and to decompose in the yard, much of its value is lost, being dissolved and carried away by rain, or in a gaseous form escaping in the atmosphere.

Another argument in favor of the use of unfermented manure, is found in its mechanical action upon the soil. We know, by experience and observation, that the decomposition of manure in the soil imparts to it a genial warmth, and renders it more susceptible of receiving the salutary influence of the sun and atmosphere. We should, therefore, reject the teaching of the self-styled professor of agriculture, who affirms that we need apply as manure only a limited quantity of mineral matter, in its most simple form; or that by burning farm-yard manure, either in the compost pile or in the stove, and then applying the *ashes*, we lose nothing that is of any value to the growing crop. With precisely the same show of reason might we reduce all the substances constituting our own food, to their chemical elements, and attempt to subsist upon those elements. On the management of organic manures depends much of their value. A slight fermentation may be of use, for by it a disposition is brought on, in the woody fibre, to decay and dissolve when it is carried to the land. Too great a degree of fermentation is, however, very injurious, as it tends to the destruction and dissipation of the most valuable parts of the manure.

In favor of the application of farm-yard manure in a recent state, a great mass of facts may be found in the writings of scientific agriculturists; and perhaps there is no subject of investigation in which there is such a union of theoretical and practical evidence.

It should be borne in mind that manures lose, in bulk, about fifty per cent. by thorough fermentation. When this is carried to excess, so as to fire-fang, they are often reduced to one-fourth their original volume.

While I speak thus confidently of the utility of using unfermented manure, I would by no means discourage its preparation by composting, when not consistent to apply it in a green state. Neither can I agree with those who think that nothing is thus added (practically,) beyond the manurial value of the material used. Absorbents may be used which will fix and retain the volatile portions of the manure, thrown off in decomposition, and which would otherwise be lost; and thus its volume and value be increased.

To what crops shall manure be applied?

While some crops are always benefited by direct and copious applications, others are grown with better success after the manure has been assimilated by previous cropping. Manure applied directly to the wheat crop often proves injurious, inducing too rank a growth of straw, or, perhaps I should say, an imperfect growth, incapable of sustaining and perfecting the grain. True, this difficulty may, in part, be obviated by previous fermentation. But if what I have said of the economy of using unfermented manure be correct, then we may adopt as a rule, that manure should not be applied directly to the small grains, or crops which are cultivated exclusively for their seeds; but to hoed crops, and such as are cultivated more particularly for their stems, stocks or roots.

It may be said that Indian corn affords an exception to this rule, inasmuch as it is cultivated for its seed, and is not injured by direct and copious application of manure. Without stopping to explain all the causes which may operate to form this exception, I only remark, that the time of its ripening being after the season of rapid growth and fermentation has passed, and by which its stocks and leaves have been supplied with an abundance of food to perfect and bring to maturity its seed, seems to indicate this as one plausible reason.

3d. At what time shall we apply manure?

It may be thought that this question is not worthy of notice. I cannot, however, think that it is wholly immaterial, although admitting a somewhat wider range. As top-dressing for grass, I would apply in autumn, or in early winter, if the ground is free from snow. For spring crops, much is said, of late, in favor of the same time of application.

While I favor this theory, and have been satisfied with its results, so far as I have observed, yet am not sure that we have sufficient data to sustain this as the best course. And beside, spring is the time when we have at command the largest supply. Let it now be used for hoed crops.

4th. Where shall it be applied?

From my own experience and observation, confirmed by such written authorities as I have consulted, I fully believe that, under ordinary circumstances, the best results are obtained from manure applied near the surface. My practice is, to apply a large portion of my manure in spring, after ploughing, and simply harrow it.

One advantage derived from this course is the more thorough pulverization of the manure, and its intimate admixture with the soil. If a large quantity of straw, or other litter, is incorporated with the manure, the whole should be ploughed under, but not too deeply. For this purpose, an ordinary plough, with the addition of a subsoil attachment, recently introduced, is admirably adapted. The manure may thus be covered to the depth of four inches, or even less, and at the same time, the soil mellowed at any depth desired.

With regard to manuring in the hill, for corn and other similar crops, and in the drill for root crops, there is a diversity of opinion and of practice. The quality and condition of the soil should be considered in determining this question. Upon strong, moist lands there can be no better course than to apply a portion, and in many cases, the whole of the manure directly to the crop, in this way. This secures a vigorous growth at first, and with sufficient strength of soil to perfect the growing plant, we are reasonably sure of securing a good crop. On the other hand, if the soil is light, and wanting in nutriment to perfect a large growth, it is better that the manure be spread over the whole surface of the field, and thus secure a uniform growth, of less extent.

It is well to have the manure removed and applied to the crops at least three times during the year. As already stated, the accumulation of the winter should be applied for the production of those crops which are sown or planted at that season. Again, about the first of August, let the contents of the manure shed be used to increase the supply of late turnips. And, in November, let it be spread upon the grass land, to answer the twofold purpose of protecting, in a measure, the roots from the severity of winter, and furnishing the proper nutriment for a full and early crop the succeeding summer.

P. STEDMAN.

A long discussion followed the reading of the essay, chiefly relating to the use of fermented or unfermented manures.

Mr. THOMPSON described his mode of composting, and saving what would otherwise run to waste, about the stalls and the privy.

My method of preparing night-soil is, to excavate a space at the back of the privy, say as wide as the vault, and as long as I wish, say ten feet, and two or more feet deep, and close up to the plank vault. I have a space open near the bottom for all to run out that will, into the open vault. Then I burn peat muck as fine as can be got, and mingle the two as fast as possible. When all has run off, take off the cover from that part of the plank vault that projects beyond the building, and bail out the remainder, and cover all over with the peat muck, and let it remain till such time as needed. I find this will produce the best corn of any manure that I have ever used. What can be made from one privy, in this manner, in a year, will manure a whole acre.

Mr. MOORE said he was accustomed to plough in his greenest manure, rather late, on sod land, and only about four or five inches deep, and plant his corn. The fermentation of this mass of green manure, together with the green grass that was turned under, created a warm root-bed, and produced a rapid growth. In subsequent ploughings he went deeper, but did not wish to bury his manure any deeper than that, as he had often, in deep covering, failed to see any immediate benefit from it.

Mr. Homer said: The process adopted by some of our farmers is, to take two parts of subsoil, loam, or hard pan, or any other earthy substance, these to be put into the yard in the fall. The next spring, spread on this one part of stable manure; then plough it under, and plough as often through the season as once in two weeks, each time sowing a little plaster, which will prevent the ammonia or gas from escaping. It is claimed by some of our farmers that this should be done in an open yard rather than in a barn cellar, as far as dry manure is concerned, as it wants the sun's effect, and a free change of the atmosphere from wet to dry. It is thought that the ploughing should be done in the morning, while the dew is on. It is believed by some that the crops that we plough and hoe are best advanced by moving the earth in the first part of the day. This manure, if sufficiently composted, should be applied to the grass as soon as convenient, after the crop is taken off. For other crops, say corn, especially corn, put on in the fall, and ploughed under; some farmers put on, say thirty-six cartloads to the acre, of this manure, on sward land; then plough; in spring, harrow; then plant the corn without further manure, and, to my knowledge, from fifty to sixty bushels to the acre have thus been raised. Now it will be seen that there is used but some twelve loads of tangible manure to the acre.

Mr. Smith, of Sunderland, thought it depended much on the character of the soil whether manure should be used in a coarse, unfermented condition, or in a finely rotted and fermented state. On cold and heavy lands, the former might be better; on lighter lands, not needing the mechanical improvement which coarse manures effected, finely rotted manures are better.

Messrs. Perkins, Loring, Taft, and others, participated in the discussion.

Mr. Garfield, of Lee, remarked, that the question of manures, and their application to soils, was one of great and increasing importance to the farmer; a subject that has been much discussed, not only in this Board, but in the local societies and farmers' clubs throughout the Commonwealth, and that, in his opinion, after much experience and many trials, no fixed rule could be adopted, that should govern the farmers, in this matter. The variety of soils which we have, their location, quality, elements, density, tenacity, and freeness from water, call for different treatment in the application of stable or barn-yard manures, and we should, perhaps, arrive at as satisfactory conclusions by relating our own practice in this matter, and the consequences resulting from this practice. My practice, for the past few years, (having no barn cellar,) has been, after clearing my yard in the spring, (usually in April,) to cart into my yard muck, taken from a marsh swamp, (it first having been thrown up and allowed to drain,) to the depth of fifteen to eighteen inches, covering the entire surface of my yard. Upon this I allow my hogs to run; my cows, also, are yarded upon it during the nights when they go to pasture, as at other seasons of the year. All of my manure coming from my stable is placed upon it, and it is made the receptacle of ashes, coal, weeds, home slops, and garbage of all and every kind.

The month of March finds me with my coarse, or stable manure, upon the surface of my yard, or upon the top of this under stratum, or depth of muck, which, for nearly twelve months has been the receptacle of the fluid or liquid substances received and retained from the upper surface or stable manure of the yard, fitting it admirably for a top-dressing for my grass lands, which I apply directly after I remove the surface manure of the yard, spreading it evenly as possible, and after a thorough bushing distributing it amongst the roots of the grass, causing a rapid and luxuriant growth of grass; and it is the best top-dressing for grass lands that I have yet found, nor have I found any soil or condition of soil to which it is not well adapted.

My practice in the application of my coarse, or stable manure, to my planting grounds, is to spread it upon the surface as evenly as practicable, and to plough it in as soon after being spread as possible, (believing the exposure to the effects of sun and air to be injurious,) ploughing my sward lands from five to six inches deep, with thorough harrowing, and planting as soon after ploughing as is practicable. In relation to further treating of my corn ground, it may not be out of connection with the subject to state that I prepare a compost, made of the yearly droppings of the hen-house, as follows: After the annual clearing of the floor of the henery, I spread upon the surface of the floor fine air-slacked lime, to the depth of two or three inches. This lime-covering of the floor insures the double purpose, not only of receiving the droppings of the hens, but furnishing for them, upon its borders, a good hollowing place, contributing to a healthy condition of the fowls, and furnishing a necessary element in forming the shells of their eggs. With about three bushels of this mixture I put one bushel of wood ashes, and half a bushel of plaster of paris, thoroughly mixing, and by repeated workings, incorporate the whole into one thoroughly and evenly mixed compost, and covering the same, to be ready for use immediately before planting. Of this compost, I put about half a pint in the hill, covering slightly with earth; and much care should be observed in this matter of covering, as instances are not unfrequent where corn has failed to sprout. When coming in immediate contact with a compost so strong as this will be, the compost acts directly upon the corn in its warming properties, not only, but upon its stimulating and fertilizing qualities, giving the corn a quick start, and vigorous growth until its roots shall be so far developed as to reach to and find the stable manure of the land, that will carry it to maturity.

This Report was then accepted.

The subject of weighing crops, having been introduced by a letter from the Berkshire Society, inquiring whether any change was contemplated, by the State Board, in the blanks furnished to competitors on farm crops, the matter was referred to a Committee consisting of Messrs. Loring, Moore, and Perkins. The chairman submitted the following as a majority

REPORT:

The Committee to whom was referred the mode of ascertaining the weight of crops entered for premium, report, by a majority, that it is inexpedient to change existing regulations.

GEO. B. LORING.
JOHN B. MOORE.

At the meeting on Saturday, Feb. 3d, the matter coming up by special assignment, Mr. PERKINS presented a verbal minority report, recommending that existing regulations be withdrawn. This led to an animated discussion, a large majority maintaining that the regulations, properly understood, were neither onerous nor unreasonable, and that if the State were to continue to pay out large sums in bounty, it had a right to expect something of accurate results, and it was the duty of the Board to see that all reasonable means for securing such results were adopted and applied in good faith.

Dr. Loring submitted the following amendment to the rules as printed in the blanks:—

"Committees on crops, either of themselves or by vote of the society to which they belong, are authorized to select such number of crops from those entered, as may, in their judgment, be entitled to the premiums offered, and apply the foregoing rules to these crops only; but, in all cases, as many crops shall be examined under these rules, as there are premiums offered, if the number of entries comes up to the number of premiums."

This amendment was adopted.

Mr. Davis also offered the following amendment, in relation to ascertaining the weight of the corn crop:—

"To ascertain the amount of a corn crop, any vessel containing not less than a bushel of ripened ears may be used, and the weight of the contents of one of said vessels taken, and the number of vessels or basketsful noted. The weight of its contents once, multiplied by the number of times it is filled by the crop of ripened ears, shall be considered the gross weight of harvested corn in the ears. One of said vessels, full of ripened ears of the average quality and condition of the crop, shall be kept to December 1st, and weighed in the ear, and also after it is shelled, and the amount of merchantable shelled corn, as well as the amount of shrinkage, thus ascertained."

This amendment was also adopted, and the time for weighing the corn kept, to ascertain the weight of the merchantable crop, was changed from January 1st to December 1st, for the sake of enabling societies to award the premiums, so as to make up their returns at an earlier date.

On Monday, Feb. 5th, Mr. Bull in the chair, Mr. Saltonstall, chairman of the committee upon that subject, submitted the following Report on

DRAINAGE.

Drainage, as applied to agriculture, presents much too broad a field to be treated by your Committee in the narrow limits allowed them. The various able treatises, too, which have appeared within the last fifteen years, have so exhausted this important subject, that it would tax the ingenuity of the most thorough of *thorough-drainers* to say anything new to the farmers of Massachusetts, not one of whom but has, through his agricultural books and journals, become familiar with the astonishing and instructive facts developed by this most interesting science.

All know that the cause of coldness in retentive soil is the removal of the water of drainage by evaporation, and that the object of drainage is to render such soils warm, like those that are porous, by drawing the water down through the soil to the drain, instead of compelling its escape by evaporation; that in all soils the existence of the water-table nearer than four feet from the surface is prejudicial to vegetation, and that a system of drains laid at that depth must, in the same measure, reduce the level of the water-table; that roots of plants and trees cannot flourish in stagnant water or stagnant air, any more than man or fish can live in such elements; that warmth, too, is one of the chief elements in the fertility of the soil, and that stagnation or non-drainage deprives it of warmth; that the water which exudes from the drain is not the summer rain which has just fallen, but the cold water of drainage, which the pressure of the former drives out to give place to its fruitful and life-giving drops, which, as they descend, bearing with them into the soil the summer air, are, after being robbed of all their fertilizing gases, in their turn expelled by those which next fall; and that thorough-draining often adds a month to the season by drying the soil in the spring and delaying the frost in the autumn.

In an admirable paper by the well-known agricultural engineer, Mr. T. Bailey Denton, there is a graphic description of the chemical effect of thorough-draining. He says: "Every one must have observed how our cultivated plants, our crops and trees, dislike stagnant water, and how their roots travel along its surface, underground, directly they reach it. The existence of stagnant water implies the absence of air, which is an essential to the development of vegetable growth in the soil as it is to our existence above the surface; and therefore we can readily understand how essential it is to render the depth of that which our plants require for their perfect development, percolative or permeable, free or active. This is not only required, because the roots will not penetrate a bed of stagnant water, and will prosper in a deeper feeding ground, but because there are in soils organic and inorganic ingredients, which require alterations only to be effected by the absorption of gases from the atmosphere. By drainage you not only afford to plants the deeper bed to sustain them, at the rate of one hundred tons per acre for every inch of depth gained, but you correct the influence of injurious constituents of the soil; and what is more, you carry into the deepened bed those fertilizing ingredients which are constantly associated with fresh air and moving water."

He might have added, if any further proof were needed, that trees and plants send their roots along the surface, only because they have that antipathy to stagnant water; that one of the great precautions necessary in laying drains is to set them sufficiently deep and close to keep out these same roots, which never find the end of their journey downwards toward the moving water in the drains.

Believing, then, that all our farmers are familiar with the advantages to be derived from draining; that they are convinced of the fallacy of the objection which so long maintained in this country, that, though well enough for the moist clime of England, thorough-draining would never do here, where our soils are parched and baked in the hot drouths of summer; and that all have seen, either on their own land or their neighbors, the favorable effects of draining in this respect, we will briefly refer to one or two points which seem to us of importance.

Why are our farmers so slow to avail themselves of the advantages to be derived from this mode of improvement? The answer would doubtless be, by nineteen out of twenty, "The expense of the thing; it is an outlay we can ill afford." Let us endeavor to help them out of this difficulty.

All the writers upon this subject give the most explicit directions for draining with *tiles*, and uniformly advise the employment of an engineer, and to have the tiles on the ground when the operation is commenced. And very good advice it is to him who has the means to pay the engineer and to buy the tile.

But let us for a moment consider the case of one who is not so situated. The subsoil of his farm is *hard-pan*, which submits only to the pick. Nature so fairly indicates to him the courses for his drains, that he needs no engineer to aid him in this respect. He is one who is zealous to improve his land, and, like all others in these days, has the best of labor-saving machines. The boulders and rubble must disappear from the surface to leave free play for his mowing-machine; why not, then, plant them in drains, and so compel them to do him good service? The nature of the soil, as we have before said, will oblige him to dig a drain wide enough for a man to stand in, and so to forego the great economy of a tile-drain, viz., its less dimension.

Stone conduits, when well laid on our New England farms, are, when the fall is sufficient, though not perhaps equal to those of tile, well adapted to their work, and do it well and faithfully. We can speak from experience, having, within the last eight years, laid several hundred rods of drain with stone, which are perfectly successful.

Gisborne, one of the best English writers on this subject, says: "It is almost as cheap to bury stones in four or five feet drains as to cart them into heaps; we have seen instances where as many stones came out of the drain as would form the conduit; such soils are generally very firm."

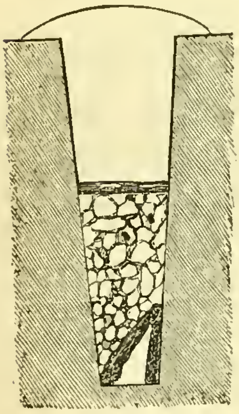
In these cases he says he "*permits*, without *approving*, the use of a stone conduit." Now, if Mr. Gisborne knew the nature of the soil with which most of our New England farmers have to contend, and should also be informed that tiles cost from $20 to $25, and even $30, per thousand, upon the ground, and that our laborers (doing ten hours' work,) command as good, if not better, pay than many of our ministers, doctors and lawyers, we think he would add that he *approved*, as well as *permitted*, stone conduits.

We will then assume that one need not be ranked as "behind the times" who concludes that stone conduits are better than none.

There are times between hay and harvest, and after harvest till winter, when one who is zealous to improve his farm can thus apply his labor. Let him, after due consideration, determine the course of his system of drainage, and first stake out his main drain, generally running along the base of the slope to be drained, and then, at intervals of from seventy to eighty feet, his stakes for the lateral drains. It being conceded that thirty-five to forty feet is the proper distance of drains four feet deep, this will allow him afterwards, if he has time and inclination, to dig a lateral in every space.

This first step being taken, the stones, cleared from every field as it is worked, and deposited along the proposed drain, will supply the proper material for the conduits. Whenever the line of a drain presents to the view a sufficiency of stones, then let that drain be dug at least four feet deep, two feet wide at top, and twenty inches at the bottom for the main, and less for laterals. As soon as open, let the stones be carefully laid, using a sledge-hammer to break those which are too large, and then, without loss of time, cover the drain.

There are various modes of laying a stone conduit. That which we deem the best, is to place a strong, flattish stone against the side, and to lean another upon it, thus, filling with small stones to within two feet of the surface, being careful to lay those which first are thrown upon the large bottom stones, so as to fill up all crevices, and to make the surface of them perfectly level. A good firm sod, laid inverted, (often the very sod taken from the drain in digging it,) straw, leaves, brush, leather-scrapings, or potato-tops, on the stones, will prepare them for the earth, which should always present a good crowning surface when filled. The balance of the soil can be spread over the land, used for compost, or for any other purpose.



After carefully laying the main conduit, there is no necessity for immediately attacking the laterals, and the same with them. It may be the useful and interesting occupation of years. When, however, the system is complete, there will be the satisfaction of having made not *two* but *twenty* blades of grass grow where one grew before.

This mode of draining has been most absurdly underrated.

In low lands, where the fall is insufficient, on pure clay soils, or on any where there is no superabundance of stones, and on large estates, where the outlay is of no account, *tile* is the only material for conduits. There is something approaching the beauty of the arterial circulation in the exquisite working of a perfect system of tile drainage.

But in the instance we have supposed, when, in addition to the reasons presented, it is remembered that the displacement of one tile by an inch, through action of frost or other cause, or the filling of the tile with sand or silt, which often happens, utterly destroys the conduit, we cannot but believe stone of greater efficacy.

It is impossible to exaggerate the good effects of judicious drainage.

Money thus expended is far better invested than it would be in adding other acres to the farm, or in the purchase of fancy fertilizers. It is the grand manufactory of all the phosphates and the super-phosphates that you have erected under your own soil.

Any one who has planted potatoes in March, in the field where he could not once plant them in May; or who has seen his grass, after cutting three tons to the acre, green and fresh, while his neighbor's was yellow as straw; or who has stood by the outlet of his drain system and seen the water gushing out, where before it was left to stagnate in the soil, to wash over its surface, and to chill it by evaporation, must feel the most ardent desire to persuade farmers to provide for themselves the same great source of happiness.

If anything herein contained will induce the farmers of Massachusetts, who have hitherto been discouraged by the expense of thorough-draining, to begin a system which will, in the end, render them the most ardent converts to the art, the object of this Report will be secured.

This Report having been accepted, Mr. CLEMENT, as chairman of the committee, submitted the following Report on

WOODLANDS AND FOREST TREES.

Woodlands and forest trees have been written about and talked upon many times. The shameful waste practised to an alarming extent formerly, and latterly in a more limited degree, has often called forth a sharp rebuke from the more thoughtful and provident portion of the community. While we are ready to admit that in many localities the owners of woodlands have learned an important lesson in the practice of a better economy, pertaining to the proper treatment of such lands, we have to lament that in other sections extravagant wastefulness is not yet out of practice.

Before proceeding with the discussion of this subject, we wish to remark that it is one of such fertility, so suggestive, that we must keep in mind the fact that a book is *not* to be written, and that it is not necessary, or to be expected, that an extended list of species or varieties will, or must be alluded to in order to accomplish the object for which this paper is prepared.

If what we write shall lead those possessing forests, to reflect upon, to consider well the subject in all its bearings, and with large-heartedness, let generations yet unborn have a share in those thoughts, before sending the "wood-chopper," with axe on shoulder, to make an indiscriminate "felling" of wood and timber trees, we shall feel a consciousness that our effort has not been altogether vain and useless.

We have no complaint to make for cutting wood in sufficient quantities to supply those with fuel who have it not, and where coal is not obtainable, or if for good reasons it is preferable to the latter named article. Our aim is rather to stimulate persons who are fortunate enough to own wood-lots, to the exercise of judgment, forethought, and discrimination, as to where, when, how much to cut, and what to leave uncut. The acres and scores of acres which may be seen scattered here and there throughout every county in this State, and of all the States, of comparatively barren soil, is the clearest evidence that can be adduced that those qualities of the mind have not always been exercised to their utmost stretch of capacity.

Two reasons may be assigned why so much thoughtlessness has been manifest in the destruction of the noble forests formerly abounding throughout all New England.

1st. Its great abundance, both for fuel and for timber, *seemed* to the proprietors to render all thoughts and practices of economy on that score nugatory, and time and mind expended for naught.

2d. It is fair to presume that comparatively few individuals of preceding generations ever dreamed, either while asleep or awake, of the ameliorating, equalizing and softening influences which forests have upon the atmosphere and the climate. Thus we are brought to a very important point for consideration. At the present day, horticulturists (orchardists,) understand well the advantages of having their grounds protected by belts of forest trees. Herdsmen (stock raisers,) appreciate the value of a forest on the north side, adjoining their large and open pastures, into which their cattle can go for protection against cold and raking winds and severe storms.

Think you that if the Western prairies were interspersed with copses of evergreens, with forests of deciduous and evergreen trees intermixed, against the leeward side of which cattle could stand, and into which they could plunge, seeking shelter from the cutting prairie winds, we should see so many accounts of their taking shelter on the warm side of a haystack, and freezing to death at that? We trust not.

Besides the breaking, sifting and screening the chilling blasts, and gusts of wind, thereby rendering our winters endurable, it is a well known fact that woodlands are quite as beneficial in making the climate bearable during the heat of summer. Our forests are great reservoirs of water. The coating of leaves which the ground annually receives, the mass of roots penetrating deeply the soil, drawing up, all serve to equalize the moisture; hence the soils in our forests are almost always wet, even to the very surface. In winter, when the earth may be frozen a foot or more deep, while having the protection of a little snow, the forest in proximity will protect the soil within its depths from frost, so that it may be penetrated with a spade at any time.

In summer, when the naked soil may be dry, like a heap of ashes fresh from the furnace, to the depth of a foot, the earth in an adjoining forest may be found to contain sufficient moisture up to the coat of mulch, which lies on the surface. Considering those conditions, who can estimate the calamitous consequences which would arise from a removal of all the forests in New England? We think the rigors of winter and the parching heat of summer would alike be unbearable. We have no fears that the woods will, while the earth is inhabited by man, be all cleared away, and make the allusion only because we believed that in proportion to the diminution of woodland will the atmosphere and climate grow more variable.

There are other considerations which more immediately concern the present, and more particularly, generations which are to follow. Fire-wood and timber for the thousand and one purposes for which timber is required, has, on account of scarcity of some varieties, for special purposes, already become a question of considerable moment.

Hickory wood and timber have diminished in quantity and quality at a rapid rate during the last forty years. For fuel, substitutes can be resorted to, but it is not so easy to find substitutes for all uses to which hickory timber is converted. Spare the young hickories where it is practicable to do so. Do not stop to inquire whether they are butter-nut, pig-nut, or shell-bark, before determining whether to forbear striking the axe at the root of the sapling. Where are the large forests of stately white oaks, through which we used to ramble, gun in hand, in search of game? They have all been greatly decimated, or entirely cleared away. What is to take the place of those noble oaks? Are there others growing up which shall in time subserve a useful purpose in ship-building? The answer must be, no!

It is a lamentable state, which many well meaning persons, perhaps, have fallen into, that in cutting wood for market, or for home consumption, present good quick returns alone are sought for.

In conversation with a neighbor recently upon this very point, he remarked that he was looking out for *himself*, and that the next generation must look out for itself. Aside from his apparent sincerity, one would know he told the truth by the manner in which he *slashes* into his wood-lots.

That is not a solitary instance. Some there are who are constantly clearing off wood, without waiting for it to grow large enough to split once, because, as they affirm, "it is the easiest way they can get money." We think that landholders who neglect the compost heap, and the proper attention which should be devoted to the production of crops in their season, for the purpose of conveying wood to market, as many do, are pursuing a course which will not enlarge their hearts, or stretch their purses beyond the capacity for endurance.

Thousands of acres in Massachusetts lie dormant, or nearly so, for what little herbage dares to show its puny spindles and sickly leaves above the surface, is nearly or quite valueless, and to supply these acres with dressing which would cause them to give liberal returns for the outlay, is not practicable,—dressing is not to be found. It follows, then, that the best and most economical method of restoring those waste lands to a fertile state, is to plant such trees thereon as are adapted to the location.

By so doing, the soil would be improving in quality, while at the same time it is producing something which will be useful in future years. In addition to those two points, the benefits to be derived from improved atmosphere and climate are not to be overlooked.

If the inquiry is raised, how shall those naked and barren lands be covered,—planted with trees,—we answer, that if *seed* is used, follow nature as nearly as practicable in the distribution, or at least in the covering of the same varieties.

If transplanting young trees is resorted to, use what common sense and practical knowledge you can command. In some instances one, and in some, the other method would be found more advantageous.

For the light and more barren lands and sandy soils, we would recommend the pitch-pine, and its propagation by sowing the seed, which needs but the slightest covering imaginable. We have ocular evidence, almost daily, as to how readily these seeds will germinate in our old worn-out pastures, in proximity with a seed-producing tree, with no other covering or protection than a scanty coating of herbage. If that hint is not sufficient, use a hoe or other implement; but, by all means, let the covering be very shallow and light.

On soils a grade better, where white pine may be grown, we think transplanting may be frequently practised to manifest advantage. In the first place, we frequently see four or five times as many spring up spontaneously as ought to remain on the same space. The plants, when two or three, or even four, feet high, may, with facility, be removed, using a sharp spade in cutting round, and lift them with a ball of earth adhering to the roots. In *no* case draw them from their native bed without loosening the soil, for pine roots are very tender and will not bear grazing. Plant two to four hundred on an acre, which will be making a liberal allowance for failures and for removals as the trees advance in size. One hundred and fifty well grown white pine timber trees on an acre are a good crop.

If *seed* is used, instead of setting young trees, we would sow much thicker, in order that the young plants should afford each other protection until they get a fair start, when they may be removed as becomes necessary, or they may all remain. The larger trees will eventually stifle and choke out the small ones.

Red cedar and larch will thrive on rocky hills; white cedar in wet swamps, where scarcely anything else can be made to grow; spruce, hemlock and white pine in regions between those extremes of wet and dry.

The white ash flourishes in wet meadows and runs, in deep loams and by the side of streams. Its value for various uses is, in a large measure, appreciated, so we will not occupy space by enumerating them. This tree may be propagated from seed with facility. Gather the seed before it falls from the trees in October, and plant in drills as for pease, when they may be regarded as sure to come—as much so as any good garden-seeds, with the usual care in planting. The young trees are as safe in removal as an apple-tree. Indeed, in planting a hundred ash trees ten to twelve feet high, we believe failures would be as rare as in planting the same number of any kind of fruit-trees. Save all the saplings of this kind, which give promise of making timber, when sufficient size is attained.

Having glanced briefly at a few of the more valuable kinds of timber, without specifying their various uses, presuming that to be a matter well understood by most New Englanders, we desire now to turn our attention to the treatment of woodlands and forests which are already advancing in various stages of growth. Our cities and villages each furnish a market for timber and for fuel, either greater or less in extent, according to size.

The network of railroads which traverse almost every nook and corner of this section of the country are great consumers of firewood, as well as chestnut timber, and we propose to present some statistics, in another place, which will convey an idea of the magnitude of the consumption in that direction.

Within a circle, ten to twenty miles from our cities and larger villages, farmers have—many of them, at least—adopted a system which is not altogether faulty, in cutting off wood for market, or in large quantities for any purpose. We refer to the practice of cutting clean. Where the growth is of a species that will sprout from the stool, throwing up vigorous shoots, and the kind of wood not of any particular value for timber, or for other purpose than fuel, we judge it commendable to make clean work. We have now, in the mind's eye, a tract of land from which the wood has been twice cut within our recollection, and it is now nearly ready to have the axe again applied. The growth is a mixed one, consisting of poplar, white birch, with various oaks, soft maple, &c.

If a wood-lot contains a goodly number of white oaks, hickories, beech, ash, or other varieties valuable in the useful arts, and the soil is capable of producing large trees, in many localities we would recommend that the less valuable trees be removed by degrees, and by such a process as shall work no injury to those remaining, but rather hasten their advance towards maturity. We have a little experience of our own, and more observation in respect to this thinning process, which may as well be related here.

B. F. Cutter, Esq., of Pelham, N. H., has, for twenty-five years, more or less, practised thinning out his young wood-lots, procuring a large share of the fuel used in his house in that way. This is his method of proceeding. In order, however, to give a correct idea of the condition of his woodland, and the character of growth, we will first state that thirty years ago the old oak growth was taken away for ship-timber. The stumps, being too old to sprout, a mixed growth sprang up, with many saplings then on the ground, altogether covering the land with white pine, soft maple, grey and yellow birch, with some of the oak family. The trees advanced rapidly, but being very thick, many of them became over-topped by others, which caused them to assume a smothered and sickly appearance, dying by degrees, when thinning was commenced. The inferior trees were cleared out to that extent, that none remaining appeared choked or crowded. Where the white pines were numerous enough to constitute the growth, all else was removed. In some instances lots have been twice treated in that way; for, where the pines are thick, they not only kill every other kind of tree, but soon begin to overshadow and choke out inferior trees of their own kind.

Mr. Cutter argues in this way, in defence of the course he has pursued. Trees spring up vastly thicker than they can mature; that a large proportion of them must fail before reaching a size suitable for timber, or for market-wood even; that it is better to cut away a portion as they begin to fail, and let those remaining have the full strength of the soil, with what nourishment they can get from the decaying roots and branches of trees removed, in addition to the advantages derived from a better exposition to the genial and vitalizing influences of sun and air. The argument is, in our judgment, sound in all respects, and forcible in proportion to the market value of fuel in the vicinity.

One piece of land was a pasture forty-four years ago, at which time we remember to have seen the bushes cut with an old-fashioned bush-scythe for the last time. White or gray birch and white pines soon took possession, in about equal quantities, and were permitted to grow unmolested for twenty years, when the birches were found to be tumbling down from a chronic weakness in the trunks, quite extensively prevailing, owing to the crowded condition of the trees. The birch was all cleared off, together with such of the other trees as appeared to be past recovery, making a fair crop of wood.

Twelve years' subsequently, the weaker among the growth of pines were cut, and the wood marketed—say twelve cords to the acre—besides the refuse wood which was used at home. Recently, more trees, which had ceased to grow, have been taken out, so that since the period first named two crops of wood have been harvested, and there is now about one hundred and fifty good trees for lumber remaining, besides some of smaller dimensions, on an acre, in fine, thrifty condition.

The writer, twenty-five years ago, came in possession of a beautiful lot of saplings, on soil of sufficient strength to carry a growth of heavy timber. Amongst the black and gray birch, white maple, white pine, were many nice appearing seedling white oaks, about the size which would naturally be selected for transplanting. Some were taken up and disposed of in that way, which would not then have been done had we known the degree of uncertainty of success in planting white oaks, which experience has taught us. Full seventy-five per cent. of all our planting have failed the first year. A half acre of said trees were carefully trimmed with shears and knife. For a few years they did look finely, but the pines got the inside of the track, and, where they were not more than a rod apart, in twenty years drove every other tree off. When we learned how the oaks and other trees were disappearing, we went to work and saved some of the smothered growth for fuel. White pine timber trees now monopolize the premises.

The Pelham gentleman, to whom we have previously alluded, when a boy, went out with a sister to procure a distaff for a foot or linen wheel, and clambered up the sides of a large granite boulder, in order to cut off the top of a small white pine standing by its base, and which they would thus be enabled to reach; but which they finally concluded to leave unharmed, on account of its beauty, and seek a distaff elsewhere.

A few weeks' ago the writer saw that tree, and, in his judgment, it contains a thousand feet of lumber, and more than a cord of wood.

We will now refer briefly to another branch of the subject. A man finds himself in possession of ten, twenty or thirty acres of young growing wood, which is all he has, and from which he desires to obtain fuel for family use ; but the growth being too small to cut off clean, he finds himself in a quandary as to the manner of proceeding in the premises. We do not hesitate to recommend the following plan. Begin on one side of the lot ; cut the inferior kinds of trees, if there is variety ; if not, take the poorer and more crowded of the one variety, those which are lagging behind, using discretion as to the amount which may with safety be removed.

After cutting in as far as is convenient to throw out, go an equal distance further in and clear a track sufficiently wide to pass through with horse and sled ; cut and throw up to that passage, and proceed thus as it becomes necessary. By the time the lot has been over in that way, probably it will do to cut clean and secure a renewal from sprouts. Have no fears of damage from clearing paths seven feet wide, which will afford sufficient room for the team indicated. Neither will it harm the trees which are to make the forest to cut side branches from the deciduous kinds, provided the trunks are not scarred in the act of pruning.

The practice of trimming pine trees is not to be commended, except in the case of dead and decaying branches, and the utmost caution should be exercised, for, at whatever season in the year the work is done, if the green bark is marred or scratched, bleeding is sure to ensue. Should the growth be of a kind valuable for timber at a more advanced stage, we would advise another thinning; this time so thorough as to give free ingress and egress in almost every direction. If you do not live to see the third crop removed, your successors will hold you in grateful remembrance, on account of the interest and forethought manifested in their behalf.

Having hinted at pruning, we cannot forbear to remark, in addition, that in no case should the practice be resorted to when the timber is large, and especially, if intended for ship-building, for which purpose, a sound knot is much less objectionable than a hollow, or such a bulge as a tree would naturally make in closing up where a branch had been dissevered.

If, for any reason, it becomes necessary to remove a live limb from a tree of that sort, saw it off a foot or more from the trunk, unless it is a little sap-shoot, so called, in which case it may be closely cut.

We have cited *some* of the benefits accruing from woodlands and forest-trees, and briefly glanced at and recommended a course of treatment for such, while in a growing state.

This has not been done in the belief that *all* whose eyes shall meet this will be as firmly convinced that the subject is an important one, and worthy of consideration, as are the members of this Board. Some less thoughtful and more improvident persons may be found in all communities, who will regard this talk and writing about using up, exhausting all the valuable timber, and ruining the soil and climate, as extremely visionary. Why, say they, see the growing wood-lots all round, in every direction.

Well, we do see them, and regard them (the trees,) as pigmies, compared with the growth forty to seventy-five years gone by.

In order to show those who are disposed to treat these warnings against the destruction of our beautiful forests as so many acts of supererogation, that our fears are well grounded, we have taken the liberty to procure a few statistics, which we think, by analogical comparison with others in the State, multiplying by the whole number, will show pretty clearly and convincingly so, at least that wood and timber are being used rather faster than those valued articles spring from the soil. We learn, through Edward Tufts, Esq., who has been paymaster at the Merrimac Print Works for a third of a century, that six hundred cords of wood are annually used for the purpose of extracting the acid for the use of that company alone.

F. H. Nourse, Esq., local agent for the following named railroads, making all contracts for wood used on the several lines, kindly furnished these facts: Boston and Lowell; Lowell and Nashua, including the Wilton, 55 miles, Woburn, 10 miles, Stoneham, 10 miles; Lowell and Salem, 25 miles; Lowell and Lawrence, 13 miles; Stony Brook, 17 miles. In the aggregate, one hundred and thirty miles of railroad, consumed, from Oct. 1st, 1864, to Oct 1st, 1865, ten thousand nine hundred and fifty-two cords of wood. During the same period, five thousand seven hundred and forty-one tons of coal were consumed by said corporations.

A. L. Brooks, Esq., who has been a resident of Lowell more than a third of a century, who has been for many years, and is now, largely engaged in the lumber business, furnishes the following facts: I cut, says Mr. Brooks, from three to four millions of lumber yearly, about one-half pine, the balance spruce and hemlock. The two last named come from the head waters of the Merrimac. I also use one million of lumber annually in the manufacture of boxes. (Such boxes as the manufactories of Lowell use for transporting goods.)

Norcross & Saunders, also of Lowell, cut about five millions a year, the larger share of which is spruce and hemlock, and like that of Mr. Brooks, is floated down the Merrimac. Mr. Brooks adds this: "Our pine lands are amongst our most profitable when allowed to grow pine, and my idea is, that edge tools should not be used in a young pine growth."

Messrs. Whitney, another lumber firm in Lowell, whose business operations are not limited to the length and width of the nation, have a trade of about seventy millions per year. Their lumber is mainly from Canada and Michigan.

In the preceding pages we have attempted to show that there exists a necessity for husbanding and caring for our woodlands; have also suggested some modes of treatment for young forests, and how to acquire others. One other point, which is in relation to the best time for cutting timber, and we close. Immediately after the breaking out of the recent rebellion in the Southern States, our government, as we all know, found itself under the necessity of contracting for large quantities of oak timber, to be used in the construction of gun-boats, and other defences of the nation's life, much of which was cut in early summer, when the trees were full of sap, or water. After four years of service, those gunboats are examined, and pronounced unworthy of repairs, because the timber is *rotten.* We attach no blame to any one for that misfortune. Delay in procuring the armaments was not admissible. At the same time, however, had it been possible to have had that timber cut in the months of October and November, we have no doubt it would have been four times as durable. Our views upon that point accord with those who have a large experience in the cutting and using of timber. Mr. Brooks, whom we have before quoted, with others of like experience, informs us that worms (larvæ of beetles,) work in no kind of timber cut in October and November,—that no sort of timber can be kept clear of such larvæ, if cut from May to July. That testimony is concurrent, and is worthy of consideration where durability adds value, as in the case of ship, or other building, in like manner exposed to the dissolving influences of the elements without, and the secret gnawing of larvæ within. Fuel cut in early winter is vastly superior to that left standing until the sap begins to flow in the spring, when, if then cut, much care is requisite in order to dry out the sap and prevent decay. ASA CLEMENT, *Chairman.*

The above Report having been accepted, Mr. THOMPSON submitted the following on

FRUIT CULTURE.

This subject has been written upon by the most distinguished fruit culturists in the State.

But, as a matter of history, we wish to look back some thirty years and take a hasty glance at those times when fruit-trees were laden with abundant crops of the fairest of fruits, selling for mere nominal prices, compared with the prices of to-day. Then the best of apples were $1.50 to $2.50 per barrel, while to-day the same would sell for from $5 to $8 ; and apples in a dried state are over 300 per cent. above former prices. Pears by the piece were then one and two for a penny; now the same at corresponding seasons sell for from five to ten cents each. Cherries were from ten to twelve cents a quart, and now eighteen to twenty-eight cents per pound.

In fact, we need not dwell longer, but ask why it is so, and what are the causes? Can they be ascertained, or shall we be obliged to abandon the culture of fruits in this Commonwealth, except in small gardens, or at such extravagant outlay, that the prices must continue to advance, until they are beyond the means of the great mass of consumers?

We hear it said every day, by persons going into fruit-shops, "Do you say that apples are fifty cents a half peck? Well, I can't afford that." And so they are debarred from the use of one of the most healthy fruits, and one that enters into the greatest variety of dishes (as well as the dessert,) of all that are known.

When the cost of transportation has been so materially reduced by the increased facilities of getting to markets, we should suppose they could be afforded for the same, or a less price, than formerly, by allowing for the difference in the value of money and taxes.

Still, we are aware the above queries can be partially answered, by the fact of the population in the Commonwealth having about doubled in the last thirty years, the large cities and towns receiving the increase, thus rendering the lands adjacent of more value for building and market-gardening, to the destruction of orchards and neglect of fruit culture, except by the amateur, and he, by knowing the wants and resources of these large commercial and manufacturing cities and towns, asks such prices for his surplus products as will amply repay him for the great outlay in producing them. And, again, as the population increases, the forests decrease; and thus, by destroying the natural refuge of birds, and shelter of the orchards, we are exposing the former to every sort of enemies, and the latter to sweeping winds and the ravages of insects.

The question now arises, Is it best to abandon the culture of fruit in this Commonwealth, or shall we declare a war of extermination upon the insect tribes that are destructive to the orchards and gardens, (and we almost said upon all who destroy or frighten the birds?) If it is war, let us begin with the tent caterpillar, by getting a pole of the proper length, a lot of old pieces of cotton waste or cloth, some matches, and the kerosene oil-can. At the time the nests are as large as a teacup, or less, we will proceed to the orchard, and wind some of the waste or cloth around one end of the pole; then pour some oil on and fire it with a match, and hold it to the nests. Thus a man or boy can destroy hundreds in a few hours, and you will find it a pleasure to roast them out.

To battle the scaly bark-louse, you must do it by scraping the trees after the fall of the leaves. Or take one pound of potash in two gallons of water, (or less, if the trees are old, with thick bark,) and with a paint-brush go over all parts where the scaly rascals are lodged; and better if the whole tree be washed. If this does not destroy the eggs, it will soften the shell, so that frosts will finish the work. Another method is to make a solution of potash or oil-soap—one pound of either in five gallons of water—and, with a syringe or force-pump, throw it all over the trees—say about the middle of May to the same time in June. This will also check or prevent many other insects from injuring the young fruit.

As yet, we have not seen anything so effectual against the ascent of the canker-worm moth as the sheepskin and kerosene oil, recommended by Mr. Flint. Or a piece of canvas, tied around the trees below the branches, and kept saturated with oil and tar as often as it dries up. If these are adopted, an old piece of cloth or hay can be wound around the base of the trees, to absorb what oil and tar may run off, and thus prevent the borers by the same operation.

For the destruction of winged insects, there are various ways pointed out by different writers; but we shall advise encouraging the return of birds, and protecting them in every possible manner. For a shelter to the orchards and gardens, and refuge for birds, we should plant belts of evergreens—say twelve to twenty feet wide—with elms and maples interspersed so thick as to break the wind from the north-west to north-east, and more if convenient; and these belts, by being so near the fruit-trees, will be a refuge for the birds, when unavoidably disturbed, and hide them from boy or man and other hawks that prowl around to destroy them.

A few years ago, when the army-worms were like to destroy the wheat and grain crops, it was thought to be a national calamity; and so it would have been, as bread is the staff of life. But let us compare a little, and we shall find that the fruits of all sorts consumed in this State, cost about equal to the flour; and still we allow armies of worms to devour our fruit-trees, with hardly an effort to prevent them. Hence the prices must increase. Formerly the farmers raised fruits; now they pay but little attention to them, and so the quantity does not keep up to the demand.

If farmers and gardeners could be induced to make some figures in this matter of fruit-raising, they would see that it costs $25 to $50 to raise an acre of corn, and get but $30 profit on the whole acre; while an apple-tree takes but a small portion of an acre, and, with a slight annual outlay in labor, will yield nearly as many dollars.

Now, if these results cannot be reached by every one, we can make the trial by spending a few hours' labor to protect, cleanse, and renovate our trees. For new orchards, we say, set your trees thick, if you have to cut out every other one, or more, when they grow too large; they thus protect each other, and shelter the ground from the scorching rays of the sun. By planting many trees on a given space, we can get a fair return while they are growing, and not feel that a crop of vegetables or roots must be raised among them. If the orchard be fenced close enough for a poultry-yard, they would keep the ground clear of weeds and insects, besides being a source of profit. If this plan be followed out, an acre, properly located, can be made to produce an annual income of a thousand dollars.

Suppose it costs two hundred dollars to prepare and fence the land, purchase one hundred and fifty trees, and set them out. At the end of the first three or four years they will have paid the first cost, if they have had but a slight annual outlay in labor, after which the profit increases.

Now lay the same amount out in sheep, and run the two for ten years, keeping correct accounts of hay, grain, extra fence, shearing, and the labor bestowed on each, and, we venture to say, the sheep will be abandoned for the orchard.

A few years ago a man bought some apple-trees that had been taken up some three weeks or more, and were thought to be past all living properties. He gave but a mere nominal sum for them, and took them home and cut off all the tops, nearly to the main stem, and set them out on a gravelly knoll, where he had taken off all the top soil to make a pear garden, on another part of his land, and now used the gravelly spot for a poultry yard, (about a quarter of an acre.) The result has been much beyond his expectations, as these trees are now in the most thrifty condition, both in tree and fruit. They were set from five to eight feet apart, and now the ground is shaded from the sun, and they are bearing the finest specimens of many leading varieties. There is not a blade of grass, or any weeds growing in the enclosure. The branches mingle one with another, and thus they protect each other from the prevailing south-west winds, that sweep over the island during the summer months, which, if the trees were single, or forty feet apart, the foliage, as well as the fruit, would be destroyed.

The two pear orchards, that are doing as finely as the best located gardens near Boston, are planted so thickly that one has to stoop, and get through as he would in a swamp. The land was well prepared in each. The result is, very fine crops of the largest Bartletts, and many leading sorts. As all of the above mentioned trees have been in bearing for several years past, with like good results, we feel assured that this is the only plan that can be adopted to insure a good return for cost and labor.

JAMES THOMPSON.

Some discussion followed, upon the devastations of birds upon our fruits and orchards, and other points suggested in the Report, which was accepted.

TUESDAY, Feb. 6th.

The Board met at 10 o'clock. Mr. TIDD in the chair.

Voted, To appoint a Committee on Credentials of new members, Messrs. Garfield, Hubbard and Thompson.

Mr. KEITH submitted the following Report upon

THE RELATIVE VALUE OF MILK.

The Committee appointed to report upon the relative value of milk for the various purposes for which it is used, have examined the subject, as far as their time and observation will permit, with reference to cheese-making, butter-making, and the selling of milk.

By seventy-four experiments, made by nineteen different persons, mostly in the first ten days of June and the first ten days in September, it takes, on the average, $20\frac{90}{100}$ pounds of milk for one pound of butter; or in round numbers, 21 pounds of milk for a pound of butter.

These experiments have all been made by farmers of Worcester County, and range, in value of milk or skill in manufacturing, from $17\frac{60}{100}$ to $25\frac{25}{100}$ pounds of milk to the pound of butter. The cows used in these experiments were what are termed Natives, except in one or two instances, which were high grade and thoroughbred Ayrshires.

These experiments were unquestionably under favorable circumstances, in skilful hands, and most probably could not be attained by one-quarter of the dairymen of Massachusetts, with their present conveniences. Milk, to produce its largest amount of cream and butter, must have plenty of fresh air. The room, or house, which is better, should be entirely above ground, dry, and, if possible, ventilated on each side by good-sized blinded windows.

In cheese-making we have not been able to get so many actual experiments from private dairies; but, from the best information we can get, it takes about ten pounds of milk to the pound of cheese. New York factories have, in part, published their statements for the last three years, and the results are as follows:

1864.—425 factories, with 128,528 cows, made 32,663,014 pounds cheese. Average, per cow, 254 pounds cheese. Average pounds of milk to one pound of cured cheese, $9\frac{11}{100}$ pounds.

1864.—25 factories, with 12,130 cows, made 3,720,399 pounds of cheese. Average, per cow, about 308 pounds of cheese. Average pounds of milk to one pound cured cheese, $9\frac{86}{100}$ pounds, ranging from $8\frac{31}{100}$ pounds to $10\frac{38}{100}$ pounds of milk to one pound of cheese.

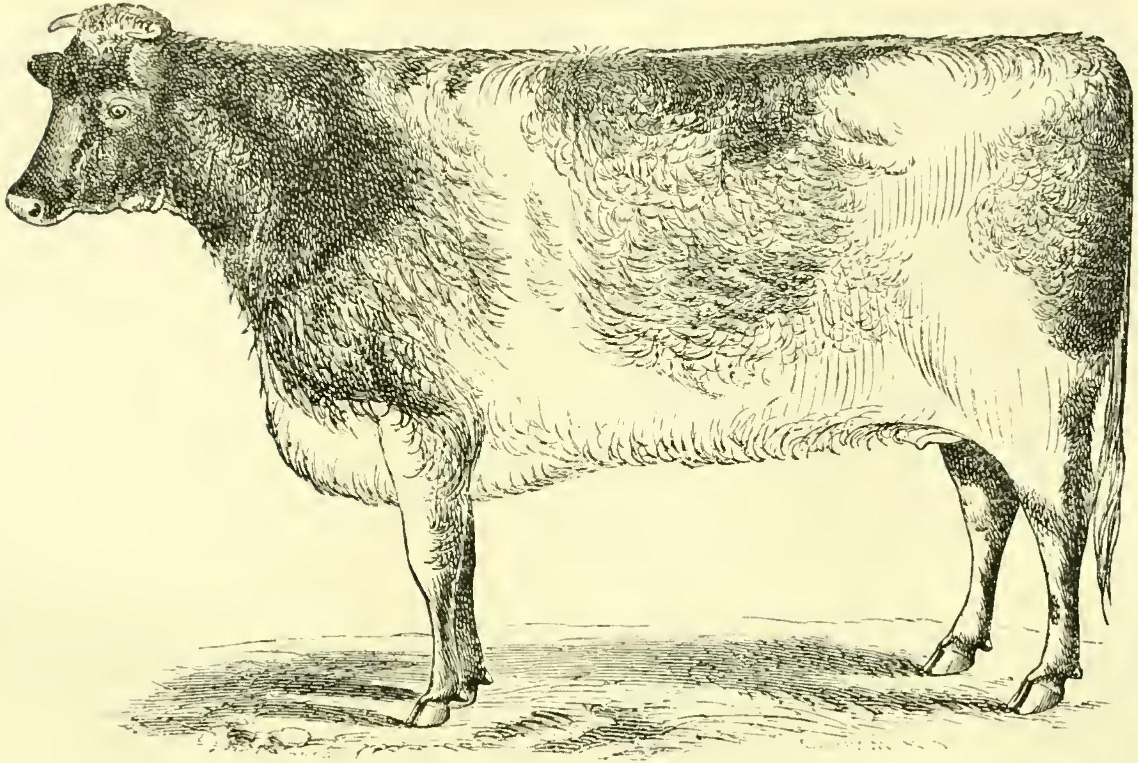
1865.—34 factories averaged $9\frac{46}{100}$ pounds of milk to one pound of cheese, ranging from $9\frac{21}{100}$ pounds to $11\frac{16}{100}$ pounds of milk to one pound cured cheese.

Massachusetts has ten factories. Reports from seven of them we have received, viz., Barre Cheese Co., Barre Central Cheese Co., Blandford Cheese Factory, (private concern,) New Braintree, Hardwick Centre, Petersham, Warren. In these seven factories the average quantity of milk to one pound cured cheese was $10\frac{17}{100}$ pounds, ranging from $9\frac{50}{100}$ pounds to $10\frac{70}{100}$ pounds of milk to one pound of cheese. It will be seen, by the comparison of figures, that the New York factories make a pound of cheese from $9\frac{86}{100}$ pounds of milk, while in Massachusetts it takes $10\frac{17}{100}$ pounds. In New York the cows yield 308 pounds, while Massachusetts cows yield 360 pounds.

We have, during the last season, visited the West Brookfield Milk Condensing and Cheese Factory, but were not able to learn much about the value of the business. Out of 100 pounds of milk they receive from 22 pounds to 25 pounds condensed milk, which brings thirty-three cents per pound, or $6.50 for the 100 pounds of milk, which is now worth $2.50, leaving a gross profit of $4.09 for each 100 pounds of milk. What it cost, to condense, can, &c., we could ascertain nothing. Another kind of fancy condensed milk, called at the factory fresh milk used by the European steamers, is milk condensed to about the consistency of rich cream or honey. This has no sugar, and, put up in eight-quart cans, brings forty cents per quart. They also can make cheese by evaporating the whey—whether of any advantage I could not learn. Another fact we learned at this factory. Whey, as drawn from the factory, will give a handsome percentage of sugar, showing that nearly all the sugar contained in milk passes off in the whey in process of cheese-making, leading us to believe that the whey is worth all that is claimed for it by the farmers connected with the cheese-factories—from four to five dollars per cow.

In summing up this dry detail of figures, the result is nearly as follows;— Milk, at fifty cents per can of twenty pounds. Butter should be worth $51\frac{52}{100}$ cents per pound; cheese, $25\frac{42}{100}$, in Massachusetts. Cheese in New York should be $22\frac{65}{100}$ cents per pound; while to condense it should bring, supposing the cost of manufacturing, marketing, &c., was the same, the milk would be worth one dollar and thirty-two cents per can, or nearly three times what it is to sell. H. R. Keith.

This Report having been accepted, Mr. Tidd, of New Braintree, also submitted the following upon



Shorthorn Heifer—"Dora Haines 3d." Bred by and the property of H. G. White, South Framingham, Mass.
[For pedigree, see Preface to the Abstract.]

THE DAIRY.

Milk, in whatever form it is used, whether fresh from the cow for consumption, or manufactured into butter or cheese, is a product of great importance, both from the amount of sustenance derived from it for human support, and the revenue received from it.

When we contemplate the amount of capital invested, and the large amount of produce obtained from this one source of husbandry, for exportation as well as for home consumption, it may be well to inquire whether, from the practice of those engaged in dairying, results are always such as should be satisfactory. The art of making butter and cheese was known from the earliest age of the world's history, and practised by the rude inhabitants of that early period, but, probably, differing considerably from the present mode ; and even in our own time, at the present day, there is a diversity of practice in cheese-making, as the variety in market, and price obtained, fully shows. But, possibly, all regard their own way best, and those who do not receive so high a price as others, attribute the failure to some other cause rather than the true one,—the inferior quality of the cheese. To have uniformity in appearance and in quality, a like practice must be pursued.

In looking at market prices, we see a variation of perhaps two cents per pound, when, in reality, the difference, from the lowest to the highest, is more than twice that, and this difference arises from the mode of manufacture, as the milk, when drawn from the cow, is nearly the same, and susceptible of producing the same kind of cheese, with the like management. In some dairies, while there will be some good cheese, there will be some of inferior quality, and this lack of uniformity lessens the price of the whole.

The subject of the dairy, and cheese manufacture, has, of late, been so fully and well treated by the able Secretary of this Board, and others, and published in their reports, and agricultural journals, that it would be superfluous in me to say anything upon this subject, were I not impelled to do so by this Board.

I shall, without going into the various methods of making the different kinds of cheese, endeavor to give, in as concise a manner as possible, the course pursued in some of the Worcester County dairies, in this State, which stand high in the market. I do this, notwithstanding the factory system is being substituted in many places for the private dairies, for there are, probably, many who will still adhere to their present practice.

In the first place, all the utensils used for milk, or about the curd, and the dairy-room itself, should be kept clean and sweet, for there is hardly anything so susceptible of imbibing impurities as milk. The milk having been drawn from the cow and conveyed to the dairy-room, should be strained through a sufficient number of thicknesses of cloth to preclude all possibility of any extraneous matter, should there be any in the milk, from passing through. Before, however, all is strained, a little annotto, previously dissolved in water, is strained with the milk. The quantity used should be sufficient only to give the curd a rich cream color, and the required quantity must be judged of by those having experience. Rennet is then added to the milk, sufficient to coagulate it in thirty to forty minutes, the milk being thoroughly stirred at the time it is put in. The manner of preparing the rennet is of much importance, for, unless this is pure and sweet, it is in vain to expect cheese of good flavor.

The milk, at the expiration of the time above stated, being sufficiently coagulated, which experience alone can determine, a thin wooden knife, reaching to the bottom of the tub, is passed through the curd, each way, leaving it in large squares; it is then allowed to stand till the curd settles, leaving the whey upon the top, then dipped off into a cloth placed in drainers made for the purpose, there to remain till the whey is drained from the curd, leaving it nearly dry; occasionally cutting it with a knife to facilitate the process, and subjecting it, in the mean time, to a slight pressure.

It is then cut into large squares, placed in a tub, and covered, to remain till the next morning; this, with the curd from the milk of the evening previous, is cut into small squares with a curd-cutter or knife; warm water is then poured over it, stirring it, and adding hotter water, till the curd will yield to pressure without breaking; then dipped into drainers, and stirred till nearly cool, and free from moisture. It is then salted, requiring about two pounds and a half of salt to one hundred pounds of curd. When the salt is added, the curd should be thoroughly stirred, that it may be evenly incorporated with it, and when sufficiently cooled, it is dipped into a hoop, in which a cloth is previously laid, and pressed down with the hands, as put in, to make it as firm as possible, and if more than one cheese is made at a time, an equal quantity should be put into the hoops, to give them uniformity in size. It is then put into the press, and pressed, gradually at first, increasing the pressure for an hour, or an hour and a half, or till sufficiently firm to take out and turn again, put into a dry cloth, into the hoop, then returned to the press, remaining there forty-eight hours, being taken out and turned once in the time. It is then removed to the curing-room, and dressed at first with oil made from the whey butter, it having been highly colored with annotto, and placed upon a shelf. The cheeses are all daily turned, and dressed with the same material, but not so highly colored. Cheese made by this process is smooth, solid, rich and mellow, not soft, easily handled in the dairy-room, and improved by age, with no leaking of whey, or soft places for flies to revel in.

I have previously spoken of the importance of having good rennet, and as this is what is invariably used in cheese-making, for coagulating the milk, I will speak more particularly of its preparation. Rennet is the stomach of the calf, as used by us, fattened for veal, and, when killed, the stomach is taken out, the contents partially emptied, and placed in a deep dish, to remain in this state some twelve hours; it is then stripped through the hands,—not wiped, or washed,—and returned to the plate and covered thickly with salt, to remain twenty-four hours, then turned, and stretched over a bow, applying all the salt that will adhere to it; adding a plentiful supply, also, to the inside. When sufficiently dried it is removed from the bow, put into a linen bag, or cloth, and kept close from insects of any kind. When required for use, put one skin into two quarts of warm water, rubbing it occasionally. After soaking twenty-four hours, remove it, and add two quarts of strong brine to the liquor; strain the whole into a vessel that can be covered tight, keep in a cool place, adding salt occasionally, so there will be always undissolved salt at the bottom. Prepared in this way it is always sweet, and of uniform strength, requiring about half a pint to curdle forty or forty-five gallons of milk, in from thirty to forty minutes. The strength of the rennet can be judged of by one trial, and the quantity regulated as required. Rennets improve by age, and ought never to be used till one year old, at least.

The question as to the relative value of milk for the different purposes for which it is used, has heretofore been considered, and I think it is a conceded fact that fresh milk, when it can be readily marketed, is more remunerative than when manufactured into either butter or cheese. This, however, depends upon the quality of the cheese, as materially affecting the price. The difference, however, when the producers dispose of it to milk companies to retail, is not so great as when they distribute their own, but they save the labor of manufacture, which, as now practised, is an item of consideration.

The next most profitable way for disposing of the milk is to manufacture it into cheese, experiments showing that, from the same amount of milk, from two and a half to three pounds of cheese, to one of butter, can be obtained. But for making butter, certain conveniences must be had quite different from those for cheese, both, however, under any circumstances, requiring much care and labor from those who have the superintendence of them.

I have before spoken of the factory system being substituted for that of private dairies.

During the last year, seven cheese factories were in operation, and an eighth, part of the time, in six of the largest cheese producing towns in Worcester County,—one in Warren, two in Hardwick, two in Barre, one in Petersham, one in New Braintree, one connected with the milk condensing factory in West Brookfield,—and two in the western part of the State. There were fifty-five contributors of milk to the factory in New Braintree, and the aggregate amount of milk received was 1,780,473 pounds. The size of the cheeses made was about eighty-five pounds, that being considered the most convenient size for handling in the curing room, and for market purposes, acceptable. The factory system of making cheese has several advantages over that of private dairies.

In the first place, it relieves the female part of the household of a labor and care which has been by them already too long borne. In the second place, it can be made at less cost, and with greater uniformity in appearance and in quality, thereby commanding a higher price in the market. This, however, is of more advantage to those who do not make the first quality of cheese, as it brings all up to the maximum price.

The factory system of manufacturing cheese is, in some respects, quite different from that of private dairies. I deem it unnecessary here to go into a minute description of the several processes practised, in heating the milk, in cutting, manipulation, and cooking the curd and preparing for the press, for, probably, all who feel an interest in this matter are informed, as particular accounts have been published, of the course pursued in the New York factories; and in those factories that have gone into operation in this State, the same process has been generally pursued, though in some of these factories the superintendents have bestowed less labor in cutting and working the curd before and while cooking, and preparing it for the press, than heretofore practised, and think the quality of the cheese improved by it.

The art of manufacturing cheese has probably not yet arrived at perfection, though a good step has been taken in advance by concentrating the labor in large establishments, and there is no reason why this work should not be removed from families to factories, as many other domestic manufactures have been.

This subject is receiving much attention at the present time. Discussions and investigations are being had, to ascertain in what way cheese may be made to suit best the home market and the foreign trade, for which there is an increased and increasing demand, if cheese shall be made to suit the market.

Butter factories are now also much talked of. Some have gone into operation in the State of New York, with great success, the butter bringing much higher price than any other, and not only this, but cheese is made of the skimmed milk, of a quality that, when sent to a warmer climate, has sold for as much, and even more, in some instances, than that made from the whole milk. Experiments are also being made to churn the new milk, and make the buttermilk into cheese. I know of an instance where this was tried, and when the cheese was sufficiently cured for eating, it was difficult to decide which was from the new milk, the quality of the cheese was so nearly equal.

If this be so, here is a decided advantage, that while we get a good quality of butter, we, of the same milk, get cheese, which, for some purposes, are equal to the best. This experiment is well worth trying.

After what has been said respecting the dairy, it may be well to inquire in what way can we most profitably dispose of the herbage of our meadows and pastures? Is it by raising cattle and making beef, or by keeping cows for dairy purposes? I am not aware that experiments have been made in this country to determine, definitely, in which of the above ways is the greater profit, but, so far as observations extend, they are decidedly in favor of the dairy.

Prof. Johnston tells us that one pound of cheese is equal, in nutritive value, to two pounds of flesh; and Prof. Low says, "There are no other means known to us by which so great a quantity of animal food can be derived for human support, from the same space of ground, as from the dairy."

In accordance with the foregoing, I will quote from the report of S. L. Goodale, Esq., Secretary of the Maine State Board of Agriculture, in which, treating upon this subject, he speaks of Sir John Sinclair as saying, "It is supposed that the same quantity of herbage that would add 224 pounds to the weight of an ox, would produce 900 English gallons of milk." Mr. Goodale then goes on to say: "If we reckon six ounces of butter or fifteen ounces of cheese to be the average weight obtained from a gallon of milk, we will get 337 pounds of butter, or 844 pounds of cheese, from the same quantity of herbage as was supposed to produce 224 pounds of beef. If we convert these into their respective money values, calling the beef seven cents per pound, the cheese ten cents per pound, the butter twenty cents per pound, we find the beef amounts to $15.68, the butter $67.40, and the cheese $84.40; or, deducting for the labor of dairy two cents per pound for the cheese, and four cents per pound for the butter, it will then stand $53.92 for the butter, $67.52 for the cheese, against $15.68 for the beef."

In the same report, Mr. Goodale speaks of an experiment bearing on this point, made in France, as related by M. Durant, in 1848, deductions from which show that about three pounds of cheese can be made for each pound of beef. Thus we see that from observations and experiments made, the profits greatly preponderate in favor of the dairy. HOLLIS TIDD.

This Report was also accepted.

Mr. PERKINS then presented the following Essay upon

FARM ACCOUNTS.

It is well known that farmers do not take that social position to which, from the nature of their calling, they would be entitled, but for the fact that they give their energies so exclusively to physical labor, that they are measurably unfitted for taking a higher social position. More thinking would insure better success, whereby there would be less call for constant labor. While the mechanic and the manufacturer are constantly improving upon the articles which they produce, and changing their hand to different constructions, as the wants of the community seem to demand, many farmers seek for little improvement or change of production, but continue in the same line, measurably indifferent to the diversified wants of a changing community, or to the different facilities for transporting productions to market.

An accurate record of all the transactions connected with farming, together with a debt and credit kept with every branch of farming, would stimulate farmers to a more correct thought in relation to their labors, and would soon induce them to see where their profits could be increased and their expenses lessened. The farmer is so much dependent upon changes of heat and cold, wet and dry, and is necessarily so long in getting the return for his labor in the form of grain, hay, meat and wool, that there is a long process of accounts; yet ten minutes spent at the close of every day, entering the results and conclusions of the day's labor, would add vastly more than the value of the time expended, to the knowledge of any one who would take the trouble to sum up the observations and labors of the day.

Some of the reasons why farmers should keep more general and systematic accounts:—

1st. It has a tendency to induce thought, whereby the standard of agricultural knowledge is advanced.

2d. It assists the farmer to be quick and accurate in figures; increases his knowledge of doing business and of accounts.

3d. It gives him a positive knowledge of his own business, and assists to make all parties with whom he is doing business correct and honest in their dealings.

4th. It enables him to decide upon those branches of farming which pay the best, so that he may direct his energies accordingly.

5th. It gives him a judgment which amounts to positive knowledge, whereby his opinions take preference to those who guess at conclusions. There is an old adage, that "figures won't lie."

6th. By examining his accounts, he is enabled to see when he has spent money that he need not, and where he could have saved money which he did not.

One reason why farmers are so little inclined to keep accounts, is because they have never been educated to it. Book-keeping should be a branch taught in all our district schools. Its study would be vastly more useful than the study of algebra and higher mathematics. When a scholar has mastered the common school arithmetic, book-keeping should come next. To be able to add, subtract, multiply and divide rapidly and correctly, and a knowledge of keeping accounts, together with a thorough knowledge of fractions, is of vastly more importance to the practical man than to be able to solve the puzzling examples of a national arithmetic, or perform examples in algebra.

We have our business colleges, (and, by the way, I think the word college, in their connection, is humiliating to the word,) where young men are fitted in book-keeping; but only a few of those who should practise book-keeping attend those (colleges,) and the rush to those institutions helps to show that our district schools might, with propriety, include book-keeping in their prescribed list of studies. We are all reluctant to take upon us labor with which we are not familiar, and to this may be attributed the reason why farmers neglect to keep accounts.

It is not expected, in urging the advantages of keeping farm accounts, that one should do more than to present a general system, which will lead the farmer to a correct knowledge of results. We had thought of writing out a short process of keeping the details of a farm account, but think it may be enough to indicate the several heads under which they should be made.

First. We should say keep an accurate account with every man with whom you do business on time. Keep debt and credit —but we should advise you to keep as little debt account as possible. Never run in debt to the blacksmith, merchant, tailor or shoemaker. Pay as you go, unless you can, by some barter trade, get them in your debt. It would be better economy to borrow one hundred dollars (if necessary,) at the beginning of the year, even if you had to pay 7 3-10 interest, and use that money with which to pay little debts, than to ask trust. When we say keep as little debt account as possible, it is understood that we debit what we pay out, and what we promise to pay; and credit what we receive, and what we expect to receive.

Second. Keep a cash-book, in which you enter as credit the money you have on hand at the beginning of the year, and all you receive during the year; and enter on debit side all you pay out during the year, and the amount on hand at the close of the year, and if you have made no mistakes, the two amounts will exactly balance. To avoid mistakes, you can balance your cash book at the close of every month, instead of the year.

Third. Make an inventory of all you possess at the beginning of each year, including farm stock, tools, produce, dues, &c; from this deduct debts, if any, and this will show you what your possessions are at the commencement of the year, and by comparing with the inventory one year previous, it will be seen whether there is occasion for retrenchment, or whether you can be more generous in your expenses.

Fourth. Have a book of farm accounts, which is independent of all other accounts, and under this head debit all expenses connected with the farm during the year, and credit all receipts. Under this account take all matters of expense or receipts, and at the close of the year, turn to your farm inventory for one year previous, and say, credit by increased value of stock, tools, &c.; or debtor to decreased value of stock, tools, &c. In your cash accounts, and also in this, and every other account, when you come to the bottom of the page, add it up and carry the amount over to the top of the next page, so that you will never have more than one page to add to see how that account stands.

When your last page is added, and you have credited the increased value of stock, tools, &c, or debited the decreased value of stock, tools, &c., then take the greater from the less, and say:

By profit of farming for 1865, ... $
To loss of farming for 1865, ... $

as the result may be.

Aside from the above account, keep debt and credit with every individual farm transaction. Charge all the labor, seed, and every other expense, to every crop you raise, and when harvested, credit the crop at the market value, or the price sold for. Strike the balance, that the book may show, at a glance, the profit or loss of that account.

Have a space devoted to *memoranda;* that in which you enter a minute of transactions which do not necessarily come under the head of accounts, but merely a matter of record of facts as they occur.

Have another page in which you enter *errors* and *resolves*, whereby you may profit by past experience; also, another page, on which you enter *misfortunes* and *losses*.

Cash Account.

		Dr.	*Cr.*
Dec. –,	*Brought over,*	$19,553 14	$20,484 40
17,	To donation to Freedman Aid Society,	2 00	
17,	sent by mail to Third National Bank, Springfield,	100 00	
17,	H. G. Parker, subscription to Cerro Gordo Republican,	2 00	
18,	advertising for school teacher in Republican,	1 00	
18,	By B. T. Quimby, 98 lbs. beef, at 14c.,		13 72
18,	To A. B. Tuttle, tax on Iowa land,	71 50	
23,	W. R. R., freight on bbl. sugar,	51	
25,	L. M. Larned, 248 lbs. sugar,	42 00	
30,	By O. S. Collins, 1 yoke of oxen,		210 00
		$19,771 15	
30,	To cash on hand,	936 97	
		$20,708 12	$20,708 12
1866.			
Jan. 1,	By cash on hand,		$936 97
1,	To gave Johnny present,	$2 00	
2.	Berkshire Mutual Insurance Company,	32 00	

Inventory of Stock, Tools, &c.

1866.		
Jan. 1,	One horse,	$200 00
	1 three year old colt,	150 00
	1 sucking colt,	50 00
	1 yoke of oxen,	300 00
	1 pair two year old steers,	140 00

Jan. 1,	6 cows, at $50 each,	300 00	
	4 yearlings, at $22,	88 00	
	6 calves, at $12,	72 00	
	60 sheep, at $5,	300 00	
	2 swine, at $15,	30 00	
	Poultry,	10 00	
			$1,640 00
	40 tons of hay, at $12,	$480 00	
	60 bushels of oats, at 60c.,	36 00	
	100 bushels corn in ear, at 50c.,	50 00	
	100 bushels carrots, at 2s.,	33 33	
	120 bushels turnips, at 1s.,	20 00	
			619 33
	1 business wagon,	$100 00	
	1 covered buggy,	150 00	
	2 harnesses,	60 00	
	1 ox cart,	40 00	
	2 sleighs,	60 00	
	1 mowing machine,	100 00	
	1 horse rake,	25 00	
	1 horse pitchfork,	15 00	
	2 ploughs,	15 00	
	Sundry other tools,	60 00	
			625 00
	Provisions on hand,	$200 00	
	Household furniture,	400 00	
			600 00
			$3,484 33

Insured for $1,500, Berkshire Mutual.

Inventory.

1866.			
Jan. 1,	Home Farm, 200 acres,	$6,000 00	
	Mountain pasture and wood lot, 100 acres,	1,500 00	
	Stock, tools, crops, &c.,	3,484 33	
	Government 5-20 bond, No. 2,890,	1,000 00	
	" 7 3-10 note, No. 15,460,	500 00	
	" " " No. 1,674,	100 00	
	Bills receivable over debts,	765 00	
	Cash on hand,	120 00	
			$13,469 33

Bills Receivable.

1866.			
Jan. 1,	James Smith, note dated April 1, 1864,	$200 00	
	John Jones, note dated July 10, 1864,	200 00	
	Bond of John Mack, March 1, 1865,	400 00	
	Sundry dues, as per general account book,	80 00	
			$880 00

BILLS PAYABLE.

John Smith, note, Oct. 1, 1865,	$100 00	
Smith, Jones & Co., as per our settlement Dec. 30, 1865,	15 00	
		$115 00
Balance,		$765 00

HOME FARM ACCOUNT.

		Dr.	Cr.
1866.			
Dec. –,	Brought from 110th page,	$3,712 50	$4,834 82
17,	To donation to Freedman Aid Society,	2 00	
18,	J. C. Brown, helping to butcher,	1 50	
19,	By B. T. Quinby, 98 lbs. beef, at 14c.,		13 72
19,	J. Keefe, 196 lbs. beef, at 13c.,		25 48
19,	J. Keefe, 4 geese, 32½ lbs., at 20c.,		6 50
23,	Geo. Hapgood, balance 143 lbs. hide, at 8c.,		11 44
23,	To W. R. R., freight on 1 bbl. sugar,	51	
25,	L. M. Larned, Worcester, 248 lbs. sugar, at 17c.,	42 00	
29,	Joel Haskins, 4½ yds. flannel, at 75c.,	3 37	
30,	By John and team, 6 days piling logs,		24 00
30,	William and team, hauling wood to Chester, 6 days,		24 00
30,	O. S. Collins, 1 yoke of oxen,		210 00
30,	To due John and William, balance for work,	43 50	
		$3,805 38	$5,149 96
30,	To interest on farm, tools, &c., 1865,	659 00	
30,	By increased value of stock, tools, &c., as per Inventory,		420 00
		$4,464 38	
30,	Profit of farming, 1865,	1,105 58	
		$5,559 96	$5,569 96

MEMORANDA.

Dec. 28, 1865.—Dressed hog and shoat. Live weight of shoat, 213 lbs.; dead weight, (loss of blood,) 206 lbs.; dressed weight, 176 lbs. Shrinkage per cwt., about 17⅔ lbs., or a little over 1-6.

Live weight of sow, 312 lbs.; dressed weight, 274 lbs.; shrinkage, 38 lbs. Shrinkage per cwt., 12¼ lbs., or less than ⅛.

Dec. 28, 1865.—Took 240 lbs. rye to mill. Shrunk by grinding, 5 lbs. Also, 487 lbs. cob corn and buckwheat. Shrunk by grinding, 5 lbs. Paid toll in money.

Dec. 30, 1865.—Cut down hay in middle barn bay. Commenced feeding north part.

ERRORS AND RESOLVES.

March 20, 1864. *Resolved*, That I will not feed straw and keep cattle so close in fore part of winter. That I will keep stock and sheep better next winter.

April 10, 1865. Have kept stock first-rate the past winter, and am well satisfied.

Aug. 10, 1865. *Resolved*, That I will commence haying earlier hereafter. That the crops may as well suffer a little at the first end of haying as too much at the last end; and will cut white tops before 18th July, and all land to cut the second crop, the first crop must be cut in June.

Oct. 8, 1865. *Resolved*, Pumpkins should be gathered before frosts.

Resolved, That I will not put dependence on the potato crop; that corn pays much the best.

MISFORTUNES AND LOSSES.

Feb. 23, 1865.—Trusted Albert Gowdy for $95 worth of beef.
March 23.—Says he cannot pay. Shall lose the debt.

April 19.—Slim-necked cow sickened and died. Think cause milk fever.

Oct. 31.—Lost one good calf, 6 months old. Cause, blackleg or murrain.

Dec. 30.—Have last clip of wool on hand, 480 lbs. It will not sell for over 60c. per lb. There is no reason for the low price of wool and the high price of cloth.

EAST SUGAR PLACE IN ACCOUNT.

		Dr.	*Cr.*
1864.			
March 23,	To cleaning tubs, 1 day,	$1 50	
23,	value of wood hauled,	10 00	
24,	scattering tubs and hooping, 1 day,	1 50	
30,	tapping, 1 day,	1 50	
Apr. 2,3,4,	3 days' gathering and boiling,	4 50	
6, 7,	2½ " " "	3 75	
7,	By sale of 100 lbs. sugar, at 18c.,		$18 00
10,	" 120 " at 1s.,		20 00
13, 14,	To 2 days' gathering and boiling,	3 00	
15,	By 8 gals. sirup canned,		10 00
15,	To 1 day gathering and boiling,	1 50	
23,	1 day gathering tubs,	1 50	
24,	1 day cleaning and putting up,	1 50	
24,	wear and interest,	10 00	
24,	By 373 lbs. sugar, at 15c.,		54 55
		$40 25	
	Profit of 1864,	62 40	
		$102 55	$102 55

CORN LOT NO. 2 IN ACCOUNT, 1 ACRE.

		Dr.	*Cr.*
1864.			
May 8,	To ploughing 3-5 day, (horses,)	$2 50	
20,	harrowing and furrowing,	1 60	
21,	manuring in hill, 14 loads,	3 00	
21,	1 day planting,	1 50	
23,	1 "	1 50	
25,	1 "	1 50	
25,	manuring in hill, 9 loads,	3 00	
26,	stringing,	50	
13,	1 day hoeing,	1 50	
15,	2 " "	3 00	
July 4,	2¼ " "	3 38	
21,	1 day pulling weeds,	1 75	
Sept. 19,	cutting corn, 1 day,	1 50	
21,	2 days' binding and stooking,	3 00	

Oct.	11,	To hauling 3 loads, ½ day,	$1 50	
	11,	" 5 " pumpkins,	1 50	
	11,	By 5 loads,		$10 00
	26,	3 loads fodder,		9 00
	26,	To husking 105 bushels ears, at 4c.,	4 20	
	26,	By 105 bushels corn, at $1,		105 00
			$36 43	
	26,	To interest on land,	6 00	
			$42 43	
		Profit of corn crop No. 2, 1864,	81 57	
			$124 00	$124 00

C. O. Perkins, *for Committee.*

This Report was accepted.

Mr. Huntington, of Hadley, then offered the following Report on

THE RAISING AND PRESERVATION OF SEEDS.

In the prosecution of the work of the farmer, the gardener, the fruit raiser, or the florist, all hope of success rests mainly on two agencies, viz.: the seed and its cultivation. They are twin sisters, from whose prolific breasts are fed all those forms of vegetable life that turn the wilderness into fruitful fields, and make the desert blossom like the rose.

In the economy of nature, they are no more to be separated than are faith and works in the Christian scheme. Slight either agency, and the instant tendency is to depreciation.

It seems to be a fundamental law, underlying all forms of life, animal as well as vegetable, that in order to insure the finest issues, the two should go hand in hand. There is an old saying, that blood tells, whether in man or beast. But if we were to illustrate the capacity of the human mind for intellectual attainment, we should not only make our selection from an intellectual stock, but take care to give the subject of our experiment the most careful training. To neglect this would be as unwise as to make our selection from among the Hottentots or South Sea Islanders, with the expectation that any amount of after culture would reveal the full, or even the average intellectual capacity of man.

The careful breeder of any of the varieties of fancy stock, in our country, will not commit the folly of lavishing time and money to secure the best strains of blood, and then expect that it will maintain its purity and excellence without his constant care and protection.

So in vegetable physiology. However true the seed may be to its kind, if its habit of growth has ever been changed by man, there is a constant tendency to revert to its original state, without his continued care. In fact, these remarks apply more particularly to those plants which have been taken out of the category of species, and by long continued skill and labor, constituted into distinct and well defined varieties. The seed of varieties so produced, is, indeed, strictly speaking, not natural seed. It has a human element in it, and, unless this element continues with it in its further propagation, preserving its purity, and supplying its peculiar wants, it soon returns to its original species. Take, for instance, the Brassica tribe of vegetables. Into what a catalogue of varieties has this been trained by the wants and tastes of mankind, and the seed of each is true to its kind, if the conditions of its propagation are complied with in its cultivation ; but place any one of these varieties by the side of the original species, on the cliffs of England, leaving it to the influences of nature alone, and not many generations will pass before it will lose its acquired form and habits, and fall into those of the species from which it was produced.

Nature provides for species,—man's assistance comes in for the formation and preservation of varieties.

Let it be understood, then, in what we have to say in this matter of raising seeds, that the seed and its cultivation go together ; the one is the complement of the other.

A complete history of the various fruits and vegetables amongst us, would, probably, show that, in their propagation, the only permanent reliance has been the seed. Other methods, such as by cuttings, layers, grafts and buds are in constant use, but these are all artificial, and tend to decay. We have no doubt that the potato rot was the result, in part, at least, of long continued propagation by tubers, instead of the seed, and it is good evidence of the truth of this opinion, that since the multiplication of new varieties by seed, the disease has, in a great measure, disappeared.

A good authority says that in grafting there is a gradual progress to extinction, and the only renewal of an individual is by seed. This has its illustration in pear culture. If we are not mistaken, thirty or forty years ago, it was confined to comparatively few kinds, and these were fast deteriorating. About this time, a few enterprising and practical horticulturists, suspecting the cause of this backward tendency, began the cultivation of seedling pears. The experiment was successful. By a careful selection of seeds, and judicious cultivation, the old varieties, if not preserved, were replaced by new ones of equal excellence, with much better constitutions. Pear culture was saved from extinction, and probably never stood higher in popular favor than at the present time.

Just now, the lovers of early fruit are meeting with great discouragement in the cultivation of the cherry. Its almost universal failure, of late, leads to the opinion that its fate is sealed. We are not enough acquainted with the history of this fruit to hazard a conjecture as to the cause of its failure, but it would be no matter of surprise with us if the true cause was found to lie in the attempt to perpetuate the old varieties by means of budding and grafting, rather than to introduce new ones by seedlings. This much we can say, that within the sphere of our observation, the only cherries that have borne good fruit the past season are seedlings.

The same thing is true of apples. In the Edinburgh Encyclopædia, under the article Horticulture, the remark is made that many of the old varieties of apples were, at one period, fast going to decay, or had entirely disappeared. From this the conclusion was drawn that "as varieties spring from individuals, all extensions, by means of grafts, &c., must partake of the qualities of the original; where the original is old, there must be inherent in the derivation the tendency to decay incident to old age. It may be assumed as a fact that a variety of fruit is only equivalent to an individual. By careful management the life of this individual may be prolonged; but, as remarked before, the only true reproduction is by seed."

To the same effect is the testimony of Professor Lindley. He says, indeed, that "seeds are not the proper means of propagating varieties;" but immediately adds that, "in annual and biennial plants, no means can be employed in propagating a variety except the seed, and yet the variety is preserved." Then he proceeds to tell how this is accomplished. "By carefully eradicating all the varieties from the neighborhood of that from which seed is to be saved, by taking care that none but the genuine forms of a variety are preserved as seed-plants, and by compelling, by transplantation, a plant to expend all its accumulated sap in the nourishment of its seed, rather than in the superabundant production of foliage, a crop of seed may be produced, the plants produced by which, will, in a great measure, have the peculiar properties of the parent variety." And it is by a series of progressive seed-savings, on the same plan, that the habits of the variety become fixed. We can see no reason why the same care and persistence in the propagation of fruits would not produce the same results. Perhaps the longer time required to bring most of the fruits to bearing, and the greater number of adverse influences to which they are subjected, are the principal reasons why this has not proved to be the case. We repeat, then, that the only *permanent* reliance for the reproduction of the individual is the seed. If we cannot reproduce the precise variety, we can secure its equivalent.

This point has been dwelt upon because it is one of considerable importance. By attending to it, the enterprising horticulturist will avoid the error of relying too exclusively on the cultivation of old varieties, and give a due share of attention to the establishing of new choice ones by seed.

We now advance a step further. We maintain that all the changes that have been made in the improvement of old varieties, and the establishment of new ones, as well as all our hopes for the future in that direction, come from the same source. The great improvement made in the quality of many of our fruits, is apparent to any one who has given a thought to the subject, and needs no illustration here. We merely instance, among vegetables, the asparagus, which, in its native state, is so dwarfish in appearance that none but a botanist would know it to belong to the same species as the elegant plant of the same name cultivated with us; and among fruits the apple, whose original, or something near it, we sometimes see adorning the front yards of our villages, but whose fruit is worthless except for preserves.

The parsnip and carrot, which, growing wild, are almost worthless; the potato, which, in its natural state, produces tubers not more than two inches in length, and insipid to the taste; and the beet, which, after being brought by long-continued cultivation, into one of our most valuable esculents, has, by the skilful efforts of Vilmorin, been made to produce a variety containing nearly twice as much sugar as its ancestors, and which promises to be readily perpetuated.

These improvements, so gratifying in themselves, and so full of hope for the future, have not been the work of a day, or the result of any spasmodic effort. They have been brought about by men whose enthusiam has been a life-long passion, and who have brought to their work an amount of observation, patience, and skill that demand our admiration and gratitude.

Let us glance for a moment at some of the experiments of that indefatigable horticulturist, Mr. Knight.

Wishing to obtain new varieties or stocks, possessing, as nearly as possible, the qualities of some of the old kinds of apples, he adopted the following plan. He prepared stocks of the best kinds that could be propagated by cuttings, planting them against a south wall, (for it was in England,) in a very rich soil. These were, the next year, grafted with the kind he wished to propagate. The following winter the trees were taken up, roots pruned, and replaced. By this treatment, they were brought into bearing at two years old. Only one or two apples were allowed to each tree, in order to get the largest and best matured fruit. The seeds from this fruit were then planted, with the expectation of getting seedlings of the desired quality. Of course, uniformity in the quality of fruit produced by these seeds was not obtained, but selection and a repetition of the process would constantly bring him nearer the object of his desire.

Here are four years spent in obtaining suitable seed, and, perhaps, twice as many more in establishing the variety sought for. It was a slow lesson to learn, but the knowledge once gained was gained for all time, and was capable of endless applications.

The same process has been, and is now going on in the cultivation of the grape. The object sought for is the production of a vine from our native stock, that shall be at once hardy, early, healthy and prolific, and whose fruit shall be of a quality fit for wine-making, or the table,—a combination of properties most desirable, it is true, but extremely difficult to realize in one individual. The success which has attended the efforts of amateurs in this direction, thus far, is most gratifying, and affords ample room for encouragement to further experiments for the accomplishment of this object.

The production of such varieties as the Isabella, the Catawba, the Delaware and the Concord, from seed, ought to convince the incredulous that immense benefits are to result from these experiments.

Those of Mr. Bull, of Concord, are so much in point that I cannot forbear quoting his own account of them: "Beginning with the wild grape, the best I could find, I got from the seedlings of that grape, first, the mother of the Concord; second, out of that seedling, the Concord; out of the seeds of the Concord, many new grapes, nearly a score of which are great improvements over the Concord, so that the pulp, which is one of the distinguishing characteristics of our native grape, is lost, and you have a grape of tender and delicate texture throughout, like the hot-house grape." Here is marvellous improvement, and the result is comprised in few words, but to secure it has been no pastime of a day. He tells us that out of two thousand seedlings he got nothing to surpass the Concord, and then, as to the time required, he says you must be content to wait six years for the first fruit, and two or three years longer to test its best quality.

But we turn from these speculations, interesting though they are, and entirely germain to our subject, to its more practical features.

In selecting a piece of ground for his operations, the seed-raiser should bear in mind one of the principles laid down by Lindley, relating to seed, viz., "that the seed is nourished by the same means as the fruit." He will see, then, that the land on which his seeds are raised is well adapted to the raising of the fruit from which the seed is taken. For instance, he will not attempt to produce tomato-seed on a cold soil, because this plant requires a warm one to bring it to its greatest perfection. Nor will he depend on soil alone, but remembering that the "seed will be more or less perfectly formed, according to the abundance of its nutriment, he will take care that there be no starving process going on while nature, in her secret chambers, toils to preserve her forms of life inviolate."

Another point, and one of great importance, is the careful guarding of varieties from intermixture. So easily is the fertilizing property of one plant carried to another, by insects and by the wind, even to a considerable distance, that great painstaking is necessary to prevent the contamination of nearly-related varieties. It would seem as if this danger was particularly difficult to guard against in large seed-growing establishments, especially where they are contiguous to one another, and where one cannot control the arrangement of the grounds of his neighbor. We have never seen this difficulty more completely obviated than has been done by Mr. James Gregory, of Marblehead.

A singular custom has prevailed among the inhabitants here, from the earliest times, of holding extensive tracts of land, most of it too rocky for cultivation, in common, and using it for pasturage. Nearly in the centre of one of these large lots, the people, in the early history of the town, enclosed a small portion and set it apart for the benefit of their minister, who made use of it as a pasture for his horse. Of late, not being used for this purpose, Mr. Gregory has secured it for a seed-garden, where, by a judicious selection and abundant manuring, he is almost sure to raise his seeds in their greatest purity and perfection.

Another point requiring attention by the careful seedsman is a proper selection of specimens from which to grow his seed. He should have a thorough knowledge of the characteristics of different varieties, and should take care that none but the most genuine forms of each are preserved for seed-plants. The common practice among farmers, who sometimes save their own garden as well as field seeds, is very faulty. Instead of making their selections from the earliest and best ripened specimens, they will take what happen to be left of cucumbers, summer squashes, beans, corn, tomatoes, &c., expecting from these to obtain a supply for the next year's planting. So, instead of selecting for the next year's seed-plants, at the time of gathering, those roots that are the most perfect in their structure, and that correspond most nearly with the particular variety they wish to perpetuate, they put the whole into the cellar, and plant out the next spring such as they happen to have left. What wonder that, with such management, gardening becomes a discouraging and disagreeable business. The professional seedsman has no excuse for such a practice; and if his knowledge is not sufficiently accurate, he should have by him some good authority for a guide.

With the utmost care, this matter of preserving varieties in their purity is no easy task. Independently of their mixture by blossoms, a change of location, or of soil even, seems to have an important influence in changing their characteristics. There has been a curious instance of this in our experience. Not many years since, we obtained from a friend in Portland, Ct., a few kernels of a very small and early kind of sweet corn. This was taken home, some sixty miles north on the Connecticut River, and planted in good soil, well manured, and apart from any other corn. It made a large growth of stalks, and when the crop began to mature, the ears were so much larger the most of them as to appear like another variety. On close examination, a number of ears were found bearing a close resemblance to the original, and much more forward than the others. These were reserved for future planting. The next crop was more even, the ears were larger than the original, but not so large as those of the last year. The same principle was again observed in selecting seed, viz., selecting before quite ripe, and taking the ears most like the original, which were always found to be the earliest.

This season some of this seed was taken back to Connecticut, not to the same place, but to nearly the same degree of latitude and to a similar soil, and there planted. The produce of this planting shows it to have returned to its exact original type, the stalks and ears being uniformly small, if anything smaller, than those from which the seed was taken. It should be remarked, perhaps, that the tendency of all dwarf kinds of corn is to increase in size, in the Connecticut Valley, as far as our experience goes.

In regard to the time to set seed-plants, or to sow seed for seed-raising, Mr. Simon Brown, in U. S. Agricultural Report for 1863, remarks that biennials, particularly cruciform plants, such as turnips, cabbages, radishes, &c., should be set early, as soon as the frost is well out of the ground. The cabbage and turnip, when set later, suffer from the heat and dryness of the summer; but they are generally injured far more by the vermin and mildew, to which they are peculiarly liable, later in the season. In regard to curcubitious plants, such as cucumbers, melons, squashes, &c., he remarks that they vegetate best where the ground is comparatively dry and warm at the time of planting, as, however early the operation is performed, they seldom make much progress until settled warm weather. Our own experience corresponds with this. Our marrow squashes were not planted this year until some of the last days of May, and we never succeeded better, though care was taken, by abundant manuring in the hill, to secure as vigorous a start as possible.

Another point, is to allow the plants plenty of room. No definite rule can be laid down applicable to all cases, but abundance of light, air and nourishment are quite necessary to plants, forming seeds; and it is only by providing for these that the seed-grower can expect a full reward for his pains.

It is well known by horticulturists that, with umbelliferous plants, such as carrots and parsnips, the seeds growing from the centre stem are not only the most perfect, but that they are much the most likely to preserve the variety from deterioration. This is in accordance with a law which seems to underlie all forms of propagation. If we wish to propagate a particular kind of grape, we must select cuttings from well ripened wood, from a main or upright shoot, because the side shoots are weakly in comparison with these. If we want to preserve a choice variety of strawberry, in its original excellence, we must be careful to discard all sets in transplanting, except those which run in a direct line from the parent plant. And among animals, it would seem as if something of the same law was discernable in the fact that in preserving particular strains of blood, a cross, even for one generation, is considered as contrary to sound principles of breeding. To the same effect is a statement we have lately seen made, that miscegenation of races produces an enfeebled constitution, if not disease, in the progeny. It can hardly be supposed that the seed-raiser will throw away all his seed except that grown from the centre stalk, as he would find but few willing to pay him its full value; but the amateur, by taking advantage of the law, and raising his own seed, can secure himself from a great amount of disappointment and vexation.

PRESERVATION OF SEEDS.

It is to be presumed that the professional seed-grower is sufficiently alive to his own interests to take proper care of his seeds after they are ripened, but as we write not for these alone, but for all who wish to save their own, whether garden or field seeds, a few words may not be out of place. The farmer has, generally, so much on his hands, that unless he is uncommonly attentive to details, he will often suffer loss during the ripening season. In regard to the field crops, such as the grains and grass, there is generally too much at stake to allow of carelessness, because a crop of wheat or rye, so poorly preserved as to be unfit for seed, would be worth little for the market. Due caution, however, is not always used even here, as there are certain seeds, such as broom-corn, beans, Hungarian grass, and, perhaps, millet, which contain a considerable amount of water when they appear quite dry. We once came near losing a fine lot of Hungarian grass-seed, because, being unacquainted with the crop, and judging only by the eye, we supposed the seed cured when it was not. Particularly is this the case with Indian corn, and it arises from the fact that its vitality is often destroyed, while its nutritive properties remain uninjured, and to the eye, it appears perfectly sound. It is very common to hear among farmers the complaint that their corn does not come up, and the failure is attributed to worms, or cold or wet weather, while the true cause is imperfect seed. Sometimes corn is thrown into large heaps, before husking, and the germinating power is destroyed by heat. Sometimes, severely cold weather coming on before the chit is dry, it freezes, and so becomes worthless as seed. To be perfect, seed corn should be selected in the field, braided and hung up immediately, each trace by itself, in some place where it will be secure from frost until thoroughly dry. Such seed can hardly fail to come, if planted any time after the first of April. Many kinds of garden seeds do not ripen all of their seeds at the same time. These should be watched, and not suffered to stand too long. In some cases it may be necessary to make several successive gatherings.

Those seeds that are enclosed in a pulpy substance, such as tomatoes and cucumbers, should be allowed to lie in some vessel with their own juice, and water added, if necessary, until the mass becomes quite sour, when, by a little washing, the pulp rises, and may be poured off.

The whole art of preserving seeds seems capable of being summed up in a few simple rules.

Gather seeds when ripe, and not before. Never allow seeds, after being gathered, to heat or mould. See that seeds are kept secure from frost until they are dry enough to resist its action.

T. G. HUNTINGTON.

AGRICULTURAL SURVEY.

By a vote passed by the Board at the meeting at Worcester, as presented on a previous page, each member was requested to prepare some account of the principal agricultural features of his own district, including statistics of stock, individual practices which might be thought worthy of public notice, &c.

This vote contemplated what may be called an Agricultural Survey of the State, and it is evident that if such a report could be obtained from every section, it would give a very comprehensive view of the leading and most striking features of our agriculture, interesting alike for present study and future reference.

Though the reports do not cover every section of the Commonwealth, they are general enough to be of great interest, and they are arranged together in the following pages for convenience of reference. The first, presented by Mr. THOMPSON, refers to the island and

COUNTY OF NANTUCKET.

Farming and sheep-husbandry, in the county of Nantucket, till within twenty years, were conducted on somewhat of a general company style, so far as the common and undivided lands were used, there being about fifteen thousand acres, on which not a tree or shrub over three feet high was then growing. These lands were owned in common and undivided shares and interests, of from one acre to several thousand acres, by persons present, and the heirs of others deceased, or removed from the county. Knowing it would not pay to get a set-off, they agreed to partition them into sections, and farm one while pasturing another. This plan was continued until, by cropping and pasturing without manure, they had impoverished them so much that, about 1822, it was decided not to plant any more, but to throw the whole into one great pasture for cattle and sheep, the latter getting their own living all the year through, by browsing on these impoverished lands, or getting into mowing lots and destroying them. In this way, a man would have but a small fenced farm, and own a large flock of sheep, horses, colts and cattle, as he need get only hay enough to keep his horned cattle and horses a few months in the winter; and they were turned out every day, cold or not, unless it was a storm too severe, and at such times the colts would come home for a little hay to be eked out to them. At no other time were they allowed to encroach on their owner, till about four years old, when they were taken up and nearly starved, to break them, (the term then used,) as it was less trouble to bring a dumb little colt into harness, than if he was spirited.

It will be seen by this method that the owners of the lands could not receive any income, but still the flocks increased, the lands becoming poorer, till there were about fifteen thousand sheep, their average fleeces amounting to the same number of pounds. There could not be a gate open in the town or out; if it were, one or more sheep would get in and destroy everything before them.

Here was a case where forty owners could annoy eight thousand inhabitants, till 1848, when the town voted to choose men for field-drivers that would do their duty, and clear every hoof from the unfenced lands and the highway. Then began the war which drove the sheep from the island, and their value into the pockets of the lawyers.

It also obliged the man with a small fenced farm to dispose of his surplus cattle at whatever price he could get, and he that owned largely in the undivided lands fenced large tracts for pastures. But the farmer had become so used to large herds that he could not bring himself to the notion that he could get along with a smaller number, and make more on them, if well fed and cared for, than on the greater number, and thus he continued to grow poorer, till it was said the more stock or undivided land a man owned, the poorer he was.

For many years before and after this time, as much hay and as many vegetables were yearly brought to the island as were raised. Then to be obliged to fence against every kind of stock was such a tax on the owner of land that he would sell at a less price than the same would bring to-day, while no other property is worth more than fifty per cent. on its cost.

The farmers, or most of them, thought it would not pay to keep their cattle and horses in good order, or fat, where now, not one in twenty but drives a good, well fed animal. Then, corn would not average more than twenty bushels to the acre; now it will come near forty. The cows of those times would not average over three quarts of milk daily, through the year; now they will yield five or more.

The causes that have produced these improvements are, chiefly, the introduction of agricultural newspapers, and the works on agriculture given out through the agricultural society of this county. While many farmers contend against these societies and their work, they are under their influence without being aware of it.

I once knew a farmer that would exclaim, "book-farming," to his neighbor, when he saw him ploughing his cow-yard several times during the summer, and carting in every sort of matter he could find that would absorb the liquids and prevent the sun from drying up the rest; but when he saw this man cart out two hundred and eighty loads of as good manure as his, and he got but eighty from the same number of cattle, he was led to ask, "How did you get all that manure, and why did you think to do as you did last summer?" "Why," said the other, "I saw it in my newspaper, and so thought I would try it, and you see the results." "Ah," said he, "those book farmers will be the end of you yet." But in a few years I saw him harness his horse, after a hard day's work, and go two miles to get his agricultural newspaper, the same that he once scouted. But as these facts are familiar to most of us, I will not enlarge.

The tenth cattle-show and fair of the agricultural society came off September 26th and 27th. The attendance was not as large as at some former exhibitions, on account of the neglect of the railroads and steam-boats to make arrangements for travelling to and from the county; but the interest of our own people was fully equal. The cattle were less in number than usual, but of an improved character. The number of thoroughbred animals was much increased—seven Jerseys and five Ayrshires, and grade Ayrshires and natives. These were young animals, of good points, all showing improved care and keeping. Of sheep there were two fine flocks of grade Southdown and native. A very fine young stallion, grandson of old Blackhawk, named

General Grant, bids fair to be a good stock getter. He was brought into the county by the president of the society, and took their premium of $75. Brood mares and colts were, as usual, in number and character much improved since they have been out to these shows. It is to be hoped, where there are so few horses in the county, that every chance of improvement will be availed of. Vegetables and grains, at the hall, were of the finest quality, although the past season has been one that will long be remembered by the farmer, as three distinct droughts, of four to six months' duration, were encountered. Crops of all kinds were much injured, as well as the hay-crop and grass for fall feed, requiring cattle to be fed sooner than usual in the fall; but the quality of hay is much better than last year.

Fruits were nearly a failure, from the many sudden changes in the weather, except in two or three gardens, where the trees were so thickly planted that they were not affected. Grapes were blighted badly—the Delaware more than any. This blight can be prevented, almost to a certainty, by the use of flour of sulphur at the proper moment,—say just at the time the vines are in bloom. From the 20th of June to the 10th of July, or up to the 20th of July, they will blight. If the weather be dry for ten days, or over, before the 20th of June, then a thunder shower, or very hard rain comes on, and the sun comes out very hot just after. I have never failed to prevent this mildew, by the thorough application of sulphur while the vines are wet, and if another shower, the sulphur must be again thrown up under the leaves, and into the new forming bunches. Suppose it takes five dollars worth of sulphur and saves five hundred dollars worth of grapes. There are such numbers and varieties of insects that attack the apple in tree and fruit in this county, that its culture is nearly abandoned, except where hens and other fowls are enclosed. Ten years ago there were not over fifty fruit trees in the county; now there are thousands, and this increase has been induced by the agricultural society holding public exhibitions.

The number and ownership of thoroughbred stock in the county are as follows; all but one having been brought to the island by James Thompson, president of agricultural society:—

James Thompson	owns	seven	Jerseys—	one	a bull.
F. C. Sanford	"	three	"	"	"
Allen Smith	"	two	"	"	"
W. R. Easton	"	two	"		
Francis Enas	"	one	"		
Joseph Vincent	"		"		a bull.
Sylvanus Mowry	"		"		"
Manuel Evans	"	two	Ayrshires—	one	"
Bailey R. Cornish	"		"		"
C. C. Folger	"	one	"		

There have been four Ayrshires sold by Mr. Allen Smith, which have left the county and gone into Barnstable, and it is desirable that all should go off, and retain the Jerseys, as this could be made the second Island of Jersey, as the bringing of stock on to the island can be controlled so easily that all confidence would be placed in their purity.

I herewith offer, in tabular form, the amount of proceeds from all agricultural sources in the county, for the past year.

The lands in farms and buildings are not estimated at half their cost, but about the present value. These figures are believed to be correct.

	No.	Pounds.	Acres.	Bushels.	Amount.
Farms, including Buildings, .	131	–	12,312	–	$160,000
Lands unimproved, not including ponds and peat swamps, .	–	–	15,000	–	30,000
Horses, of all ages, . . .	257	–	–	–	20,746
Milch Cows, 450; Heifers, all ages, 126, ...	576	–	–	–	18,927
Oxen and Steers, all ages, .	60	–	–	–	3,142
Sheep, all ages, . . .	2,153	–	–	–	7,837
Swine, ...	108	–	–	–	2,153
					$242,805
Indian Corn, ...	–	–	200	7,475	$8,223
Wheat, Barley, Rye and Oats, .	–	–	63	1,263	1,578
Potatoes, ...	–	–	46	4,807	4,807
Turnips, French and Italian, .	–	–	27	4,936	2,961
Root crops of all other sorts, .	–	–	59	11,500	4,835
Garden Vegetables, not in above, ...	–	–	50	–	7,500
Cranberries, a failure, . .	–	–	140	Barrels. 52	208
Grapes, (much too small estimate,)	–	1,159	–	–	352
Fruits and Berries, . . .	–	–	–	–	2,000
Butter, ...	–	18,000	–	–	7,200
Milk sold, ...	–	–	Gallons. 25,000	–	6,250
Hay, of all sorts, (tons,) . .	–	2,264	–	–	33,960
Wool, ...	–	5,917	–	–	3,550
Beef slaughtered, . . .	–	117,090	–	–	16,162
Pork "	–	56,958	–	–	11,119
Mutton, ...	–	25,890	–	–	3,580
Veal, ...	–	11,423	–	–	1,356
Value of all enumerated articles, ...					$129,842

There is one article that ought to be made of great commercial value to this county, which is peat, that abounds here in greater quantities than in any other section of the State, there being about two thousand acres. Much of this peat is far better than that of any other section, which I think is attributable to the salts that are constantly thrown over the deposits by the winds, from the salt spray of the ocean. The past year there has been a much larger quantity dug out than in former years,—say five thousand loads,—owing to the high cost of coal. The market value of this peat, for a cart-load of eight barrels, (eight barrels is the standard for a load, always, in this place,) is two dollars, landed in the pen. Five loads are about equal to one ton of coal. The method of preparing this peat is to turf off the top, spongy part, that is near a foot thick in the bogs, or the same thickness of soil when in a mowing meadow; then dig out the quantity you wish to make into a bed,—say five feet wide, five inches thick, and as long as your space to dry on will admit;—now cart on water, and hitch the horse to a long-toothed harrow, soften and break up the whole mass till as soft as plastering mortar; then smooth the bed off by drawing a shovel all over it, to produce a glazed surface, that sheds the rains; now, with a hay-fork, commence and check the bed all over, the width of the tines giving size of pieces. In about a week it will be dry enough to separate several inches apart; in about two weeks more drying, it is fit to cart into houses, built with open cracks between the slats on the sides, about half way up to the top, after the manner of corn cribs.

When a machine can be invented that will grind up and throw off the pieces, with the water pressed out, in a like manner to making bricks, and as fast, then peat will tend to supersede coal, unless the latter be much less in price than at present.

I will close this report by introducing David Folger, who will give his method of farming, in nearly his own language:

"My farm contains thirty acres,—is all mowing land,—twenty acres have been in my possession some years; twelve acres I have owned only two years; at the time of purchase it was very much run down, so that on mowing nine acres I got only three tons of hay. In the remarks and the facts I state I shall confine myself to the last two years. First, as to my land and its treatment. It is in lots containing from two to five acres—except the twelve acre lot. Lot number one, containing four acres, is mostly heavy loam over clay. This has not been ploughed since in my possession—some ten years. It has been top-dressed with stable manure two years in three; have never cut less than three tons of the best English hay to the acre, then rich feed for the cows till winter.

"I think there is great advantage in top-dressing such lands; we get uniform crops of excellent hay, and luxuriant feed after mowing. I find wood-ashes excellent for this kind of land. Lot number two contains five acres, two of which is meadow, mostly peat bottom. This meadow I treat as above. The three acres, mostly rich, sandy loam, over clay, have been tilled three years last past. The crop in 1864 was, of beets, 600 bushels; carrots, 250 bushels; potatoes, 180 bushels; turnips, 150 bushels; corn, 50 bushels; with a few loads of pumpkins. In 1865, sowed barley, with clover and timothy; got one hundred bushels, then turned my cows into clover to their knees. The other lots are used for mowing and pasture. My experience is, that a rich pasture for milch cows is cheapest in the end. Therefore, I pasture two or three years, then manure on top and mow for awhile, thus keeping my meadows in good order, free from unsightly bunches, and allowing the good grasses an opportunity to gain a foothold.

"While speaking of the meadows, I would say that from them I get, annually, peat sufficient for two families' fuel; then fill the hole and raise hay equally as well as before. The twelve acre lot is a sandy loam, well adapted for tillage. In 1864 I had three acres in corn, which yielded 210 bushels shelled; 1865, four acres in corn, 160 bushels; one acre potatoes, 180 bushels; one acre beets, carrots and turnips, from which I took about 600 bushels. The season was very dry, and vegetation suffered severely for want of rain.

"My method of manuring has been uniform, and the result, on the whole, very satisfactory. For top-dressing grass lands I use twenty loads, of thirty bushels each, to the acre, of compost stable manure; for tillage, twenty loads on greensward ploughed in for corn; second year, for root-crops, twenty loads ploughed in, then twenty more spread on and worked in before planting; for potatoes, as above, omitting the last twenty loads, and plant in hills with a forkful of kelp. Third year, sow barley or oats and grass-seed without manure. As my business is confined mostly to dairy produce, my chief aim is to raise grass; and I have found the above treatment produces satisfactory results.

"Raising and feeding roots may be a hobby with me, as I let no opportunity pass without bringing them under the notice of my fellow-farmers. For dairy stock farming, I do not think we begin to appreciate their value. Then again, how much more can be raised on an acre. To be sure, last year was comparatively a failure, but for the last ten years I have never raised less than 800 bushels to the acre, and many times twice that quantity.

Every day each animal on my premises has some kind of vegetable. By feeding in this way, hay is saved, the animals kept in better condition, and the land where a root-crop has grown is in better shape to bring into grass than after any other crop.

" My cows, for eight months in the year, are driven to pasture, when they get no grain or roots. At harvest I begin to feed husks and stubble ; in December, hay. In winter my cows are kept in the barn sometimes two months without turning out. I am decidedly of the opinion that it is the best place for them, both as regards economy and comfort to the animal. While the cows remain in the barn I feed roots each morning, and at night they have about four quarts of shorts, with as much of the best English hay as they will eat, and card as often as possible.

" My dry stock are fed with stalks, while they last ; then English hay, with a small quantity of roots daily.

" In feeding horses there is but little difference of opinion. When worked or driven they should be fed mostly on grain. When standing in winter I feed more hay and carrots and less grain. I keep two horses ; they do all the ploughing, teaming and driving.

" I have eight milch cows, two heifers, and one or two calves—about eight hogs in summer and four in winter—which is about enough to consume the wastes of the dairy, and compost the kelp and seaweed that I use about the cows, and the straw and waste from the horse stable.

" The results from this management are 1,050 pounds of butter ; $250 worth of milk ; (amount of milk may not be exact as no record is kept ;) an average of 2,250 lbs. pork ; last spring sold 7 tons hay, and a large quantity of roots the coming spring. Do not think I shall have more than four tons of hay to sell, and a proportionable quantity of roots, as the very dry weather of last season not only cut off our root-crops, but cut short the fall feed. My plan of feeding cows keeps them in such condition, that, with very little extra feed, they will make good beef ; and in this way I work off my cows, never keeping an old cow. When one is needed, I go out and buy the best heifer, or young cow, I can find.

" Thus I have endeavored to show, as briefly as possible, the way we manage a little farm in Nantucket.

" DAVID FOLGER."

Mr. Folger was not brought up on a farm, but has carried on the business of coopering till within the last five years, since which he, with one man, and a boy part of the time, does all the work on his above described farm, except at hay-time, when he has help to get in the hay in the best order. Every statement he makes can be relied on.

Respectfully submitted.

JAMES THOMPSON.

DUKES COUNTY.

In presenting this brief report on the agricultural interests of Martha's Vineyard, it may not be out of place to refer, in a few words, to the agricultural features of the island, its soil, surface, &c.

The island is naturally divided into three distinct sections, each of which presents a surface and soil peculiar to itself.

Commencing with the western section, which includes Gay Head, Chilmark and the north-western part of Tisbury, we find a rough surface of hills and vales, rocky and uneven. From the western extremity of Chilmark to the bounds of Tisbury, there are ranges of hills, having a general direction from the south-west to the north-east, running through nearly the entire width of the island; and the valleys between these hills are broken by numerous smaller ranges, running in various directions.

Underlying a great part of the town, at a depth which may be roughly stated at from ten to thirty feet, is a bed of clay, a large portion of it pure and free from grit, of various colors—red, white, blue and yellow—and shading from one color into another. At the western extremity of the island this clay forms those beautifully variegated "cliffs of Gay Head."

As we approach the bounds of Tisbury, this substratum either lies at a greater depth or is entirely lost.

The land of Chilmark is hard to cultivate, on account of its roughness, and the stones and boulders which are strewn with such prodigality over its surface, but the soil is good, and good crops are raised where it is cultivated. The soil is a sandy loam, mixed freely with coarse gravel and pebbles, with a subsoil generally of yellow loam.

This portion of the island is remarkable for the sweetness of its pastures and the abundance of its springs of pure water;

and the grass which grows in its valleys and on its hillsides produces the very finest of beef and mutton.

The farmers of Chilmark—more especially those along the seacoast—are favored by the enormous quantities of rock-weed or kelp, which is torn from the rocks by the surging of the ocean and piled up along their shores. This kelp possesses wonderful fertilizing properties, much of it being almost identical with the Irish moss, from which the simple but nutritious blanc-mange is made. Applied, in its natural state, to the land, it readily dissolves, forming, at first, a gelatinous mass, and gradually disappearing; going into the earth, to be taken up by the delicate feeders of the plants, and converted into a fine crop of grass, corn or grain. The writer has been told that one remarkable feature in regard to the use of kelp as a manure is the almost entire immunity of the crop from the ravages of the cut-worm.

Peat abounds in this section, and is extensively used for fuel. It is also combined with barn manure and kelp, with which it forms an excellent dressing. This section is the most favorable part of Martha's Vineyard for stock-raising, and in this respect will, perhaps, compare favorably with any part of New England.

The middle section of the island, or Tisbury, is more level, with the exception of the northern part of the town, where the ranges of hills of Chilmark are continued down the north shore, being lost in the north-western part of Edgartown.

The soil is of a finer grade than that of Chilmark, but is still a gravelly loam.

This portion of the island, although not so favorable for grazing, the pastures not generally being considered so sweet, is adapted to the raising of general crops.

The land is easily tilled, and responds readily to any exertion made to increase its fertility. Some large crops of hay and grain have been raised on fields long since worn out by repeated cropping without manure, but reanimated by the generous use of ashes and other dressing. In a few instances, fields have been made to yield from two to three tons of hay to the acre, at one cutting.

This section is well watered, there being two moderate sized streams of water, having their rise in the hill country of Chilmark, and north-western part of Tisbury, and running south-easterly towards the sea, fed along their course by numerous springs and rivulets. On one of these streams is a flouring mill, and a woollen mill, and on the other are two grist mills.

Between the villages of Tisbury and Edgartown there is a large section covered by scrub wood, a belt from two to six miles wide extending across the island from north to south. There are, it is true, intervals of cleared land, and in these intervals there are some good farms.

On the south side there is a range of ponds and coves, extending nearly the length of the island, separated from the Atlantic Ocean by a narrow sand beach. Between these ponds and coves are necks of land from one-half to one mile in length. These necks are good for grazing purposes, and being fenced on three sides by water, are peculiarly adapted to this purpose. The eel-grass, so called, which grows in large quantities at the bottom of these ponds, is torn up and drifted on shore by the heavy storms in autumn, and is either ploughed in in its natural state, or is composted with peat and barn manure, with which it makes an excellent dressing.

After passing out of the belt of scrub wood, we come to Edgartown proper. Here we find a light sandy soil, for the most part without any subsoil of loam. This section is admirably adapted to the raising of root-crops. Corn will grow here, but strong efforts must be made in order to secure a large crop. Rye can be grown to some advantage, but the soil is not retentive of manures, and needs constant renewal of dressing to preserve it from almost utter barrenness.

The land is level, but poorly watered, and however inviting the town may be in other respects, it is not a paradise for the agriculturist. Still, there are many enterprising farmers in this section, who, by untiring energy, extort from its unfruitful soil handsome crops of corn and grain.

The principal crops of the island are corn and hay, and it is claimed by the inhabitants that corn is grown here to great perfection. Rye does finely, as do all the grain crops, but all those grains which ripen early are subject to damage from the fogs, which sometimes prevail to a great extent about the time they are in the milk.

During the last season, our crops suffered from the protracted drought. Perhaps we had an average crop of English hay. Corn and grain were the greatest sufferers. It would be impossible to give any reliable statistics as to the actual amount of farm products, as the writer had no opportunity to gather the necessary information. We can only say that there has been a marked increase in the interest manifested by the farmers of the island in regard to farm improvements and the raising of better crops. The agricultural society is exerting a silent but powerful influence for good, and the friends of the society are gratified to know that this influence is shown by the steadily increasing inquiry on the part of our people as to the best modes of cultivation; the better care bestowed on stock, and the selection of the best breeds.

Sheep husbandry is receiving increased attention. Experiments have been made in former years, of introducing the Cotswold and Leicester breeds among our flocks, but not with the happiest results; these breeds are better for mutton than wool, and as wool is what the farmers of that section keep their sheep for, they find that the coarse, open fleeces are not what they desire to produce. Besides, although our pastures may be sweet, they are not over prolific in grass. Consequently, the large, mutton sheep will never arrive at that state of perfection which characterizes them in more favored localities.

Within the past three years, at the suggestion of Matthew Smith, Esq., of this Board, a few Merinos and Southdowns have been introduced, and these, crossed with the natives, are a great improvement.

There has been but very little to encourage our farmers to raise fine wool, for the purchasers, who come to the island from Boston and elsewhere, have never been willing to discriminate between the fine and coarse wool, but have paid one price for coarse and fine alike. The last season, however, some difference in price was obtained in a few instances. The amount of wool clip the past season was about thirty thousand pounds.

The chief object of interest in connection with the agriculture of Martha's Vineyard is the effort now being made to improve the breeds of neat stock on the island. It is well known, by many members of this Board, that the Martha's Vineyard Agricultural Society has undertaken the experiment of introducing a pure blood stock, which shall become *the* stock of the island.

This experiment was suggested to the society by the Secretary of this Board, and as the society was receiving liberally of the State bounty, they felt that some extra effort should be made, by which it would be shown that the State bounty was not thrown away by being bestowed upon this little county. And the isolated situation of this district seemed to make such an idea practicable.

Accordingly, in May, 1863, the society took the initiatory steps in this enterprise, by purchasing six thoroughbred Ayrshire bulls. These bulls were selected with as great care and judgment as the society was capable of exercising, assisted by Mr. Flint, and others. These bulls were brought to the island and located, two in each town, and the following circular was distributed thoughout the island:

"The Martha's Vineyard Agricultural Society having in view the necessity of a more perfect and uniform breed of cattle for Dukes County, and one which presents in combination the most desirable points and traits to be found, after investigating the subject and having satisfied themselves in regard to the peculiar characteristics of the different improved breeds, have selected and purchased six thoroughbred Ayrshire bulls, and located them as follows: * * * * * *

"It is desirable that all should improve their stock of cattle. The society offers the use of these bulls to the people of our county, whether members of the society or not; and, as the object the society had in view when purchasing thoroughbred stock would be defeated by breeding from grade bulls, those having the use of the bulls will be required to come under obligation to kill or castrate their bull-calves.

"The Ayrshire stock will be found to be particularly well adapted to our climate and feed. The cows are kind and docile, and unsurpassed for milkers as regards both quality and quantity of milk. The oxen are good workers, and attain to a good size, and readily take on flesh while being prepared for the shambles. As a select breed they are hardy, and thrive as well or better than the native on the same feed.

"As it is the aim of the society to make Dukes County celebrated for fine cattle, they earnestly desire the co-operation of our farmers in this important undertaking."

At the same time there were two heifers, one cow and a bull-calf purchased by private individuals.

In January, 1865, the society purchased the entire herd, eleven in number, of Ayrshire cows and heifers, of Hon. A. B. Conger, of Waldberg, Rockland County, N. Y. These cows and heifers are brought to the island and sold by auction to private individuals under restrictions which would operate to keep the blood pure and prevent the killing or selling from the island of any of the original animals or their progeny. In this operation the society lost about $300.

There are now in the county ten thoroughbred Ayrshire bulls, as follows:

Irvine 2d, bred by Dr. George B. Loring, owned by Hon. Wm. S. Vincent; Robert, bred by Dr. George B. Loring, owned by Alfred Norton, Jr., of Tisbury; Walter Scott, bred by Henry H. Peters, owned by Thomas Smith, Esq., of Edgartown; Lochiel, bred by Joseph S. Cabot, Esq., of Salem, owned by Nicholas Norton, of Edgartown; Bruce, bred by George W. Lyman, Esq., Waltham, owned by Ephraim Mayhew, Esq., of Chilmark; Waldberg, (calf, Conger stock,) bred and owned by Henry L. Whiting, Esq., of Tisbury.

Besides these, are four bull-calves on the island, all of reliable pedigree.

Of thoroughbred Ayrshire cows and heifers, there are eighteen in the county, as follows:

Fanny 3d, Elsie 2d, and a calf, (no name,) owned by Ephraim Mayhew, Esq.; Emily and Norna 2d, owned by James F. Cleaveland; Fanny 5th, owned by Capt. Allen Tilton; Norah, Jessie 8th and Emily 4th, owned by Henry L. Whiting; Norna and Jessie 7th, owned by Edward Mayhew; Red Lady 2d, owned by Francis O. Rotch: Elsie 1st, owned by Nicholas Norton; Fanny 4th, owned by Benjamin Kidder; Norah 3d, owned by Alfred Norton, Jr.

Besides these there are three thoroughbred calves of reliable pedigree.

The society has opened a herd book, in which are entered all the pure-blood, and grade stock, and a correct record will be kept of the ages, pedigree, color and peculiar characteristics of the animals.

A committee of the society, consisting of three members from each town, have the charge of looking up all the Ayrshire stock, whether pure-bloods or grades, and seeing that they are recorded, and also that no person violates the rules the society has made in reference to this stock.

There are about seventy-five grade heifers and steers in the county. Of these we can only say, that they are fine, promising looking animals, and a decided improvement on our old stock, but they are all young, and their points and traits are to be developed in the future. D. A. Cleaveland.

Tisbury, Jan. 25, 1866.

PLYMOUTH.

The soil of Plymouth County is generally light, and in some portions sandy. A very general impression prevails that its soil is barren, and almost universally sandy. This is true, to a great extent, of the towns of Wareham, Carver, Mattapoisett, Rochester and Duxbury, and of parts of Plymouth, Middleborough and Marshfield ; but there is some good land in all the districts.

In Lakeville and parts of Middleborough there are many good farms and meadows, much of it strong land, naturally cold, but capable of great improvement by under-draining and deep cultivation. We have no extensive river meadows in this county, but on the borders of the streams running into the Taunton River, in East and West Bridgewater, Bridgewater, Halifax and Middleborough, and on the borders of the North River and its tributaries, in Hanover, South Scituate, Scituate and Marshfield, there are good meadow lands. In the town of Abington, on the line of the Old Colony Railway, between South Abington and Hanson, watered by a stream from the celebrated pond by the side of Picnic Grove, in Centre Abington, lie several hundred acres of meadow land, which, by systematic draining, might raise a thousand tons of good hay. Similar meadows are found between South Abington and East Bridgewater. We are surprised that these lands are so long neglected.

Hingham, Hull and Scituate present some of the strongest lands in the county, with the best of natural pasturage. Although some portions are very rocky, such lands, generally consisting of a close pan of gravel or hard loam, when once subdued, furnish fine grass meadows and gardens, but are not generally warm enough for the largest crops of corn raised in this county. Land of like character is found upon the promontory known as the "Nook," in Kingston, near Elder Brewster's Spring, which is still pointed out to the traveller, and upon the promontory known as Manomet, in the southerly part of Plymouth. Cattle are well fatted by grazing on some of these lands, in Kingston, Hull, Hingham, and, we believe, in Scituate, from June to October.

The best crops of corn are raised on lighter soils, and some of the finest we have ever seen were raised upon loam covered by beach sand by the action of the winds and waves, and manured by kelp, or "sea refuse," in the hill.

We are inclined to the opinion that the statements and surveys of geologists as to soils and formations of the various sections of our State, though in general correct, should be taken with some grains of allowance. The geologist will tell you that certain towns in the county are alluvial—all drift. How happens it, then, that we have ridges of clay cropping out for a mile or more all along the rear of the town of Plymouth ? Such is also the case in other sections, which the world are instructed are purely alluvial. The fact is, that the surveys of the geologist are, perhaps necessarily, not sufficiently minute to ascertain the exact condition of the whole surface of the country.

In one respect, the climate of this county is especially favorable to agriculture. In the southerly and easterly sections, near the seaboard, we are exempt from early frosts perhaps two or three weeks sooner than in the county of Worcester. This, perhaps, is of no great importance, inasmuch as there is less sun in the spring ; and the chilling winds and blasting storms from the eastward are longer felt than in the more inland counties. The grass starts in the spring whilst Worcester and Berkshire are still covered with ice or snow, but by the middle of May vegetation in the open air is more advanced in Worcester than in the Old Colony.

But exemption from the early frosts of autumn is of great importance. It is this which insures the crop of cranberries near the sea, the late crops of corn, tomatoes, melons, the ripening of the grape and late fruits and vegetables, and the beauty of flower, foliage and forest, which is the charm of autumn scenery. We remember a season in which a frost of September 10th cut down all vegetation in the inland counties, whilst the fall election of November found the tomatoes and dahlias fresh and unwithered upon their stalks.

This is not what might be denominated a farming county. There is not a large population who are devoted solely to cultivating the earth. There is much woodland and many cedar swamps, and the majority of farmers derive some of their earnings from wood and timber lots. It is said that nearly one-half the area of Plympton is wooded swamp land. But the farmers are not unmindful of stock.

Within a few years more attention has been paid to the advantages of thoroughbred stock, and the prejudices of very many of our farmers have been subdued by the evidence of their value. We have never known a farmer who had personal experience in raising or keeping any pure-blood stock which was suited to our soil and climate, whose opinions, however strong, have not been changed, or greatly modified, by that experience. Great injury is done to the agriculture of this county, as well as injustice to valuable varieties or specimens of stock, by attempting to force them on land not suited to their growth, maturity or perfection. For this reason it is believed that a mistake is made in introducing upon the thin soil of this county the large carcase of the Shorthorn, among the horned cattle, or the Cotswold and Leicester, among sheep. They may be raised without material deterioration upon single farms, or particular localities in this county; but their general introduction here can be of no lasting public benefit.

We call to mind a remark made by a distinguished gentleman, who honored the fair of the agricultural society, in Plymouth County, with his presence a few years ago, and visited several sections of our county. He was a dairy farmer himself, and had been brought up among the herds and dairies of Worcester County. He observed that a prevailing characteristic of the cows in our county was the coarse and steer-like head and neck.

They looked as though we had been in the habit of breeding for oxen merely.

He therefore recommended a free admixture of the Jersey, or Ayrshire blood. Some of our farmers judge of a Jersey cow or. bull by the points which would seem to them harsh or repulsive in an animal selected for beef alone; forgetting what experience or familiarity would alone teach them, that all breeds cannot well be judged from precisely the same point of view. Such a judgment, concerning milk-producing animals, is as unwise as to judge between a duck and a hen by relative size or plumpness, because both lay eggs. One of the trustees of our society writes, that he considers "the inclination of farmers to call animals thoroughbred, which have a light grade of pure blood, is, to say the least, unfortunate. It shows, however, that notwithstanding their pretensions to believe new breeds innovations, they really appreciate improved stock, and I am sometimes amused at the nice distinction drawn by attempting to trace blood as proof of good qualities."

We have made some efforts to present a catalogue of the owners of pure-blooded neat stock in the county, with the breed, and, as far as possible, the age and sex of the animals owned by them. This list is necessarily imperfect, and we should be under obligations to such as know of stock which is omitted in the following list, if they would forward such additions to the writer. Besides the list of thoroughbred animals, many citizens would be surprised to learn how extensively the grades have increased in some parts of the county. A gentleman from Lakeville says: "I notice but few herds in all these parts that do not contain decided Jersey characteristics." Mr. Walter Spooner, of Long Plain, has a fine herd of Jerseys, but resides just over the line, in Bristol County. From his herd, more than any other, has Jersey stock been diffused in that section of the county.

LIST OF THOROUGHBRED STOCK.

Ayrshires.

Bridgewater, Nahum Stetson, cow, ...	1
" Levi L. Goodspeed, bull, ...	1
" " " " cows, ...	2
Halifax, Ephraim B. Thompson, cow, 4 years, ...	1

Hingham, John R. Brewer, bull,	1
“ “ “ “ cow,	1
“ “ “ “ heifers,	3
Kingston, Harrison Loring, cows,	5
“ “ “ bull, 4 years,	1
Middleborough, William R. Pierce, cows,	2
“ “ “ “ heifer, 1 year,	1
“ “ “ “ calves,	2
“ Nathan F. C. Pratt, heifer, 1 year,	1
West Bridgewater, H. H. Whitman, cows,	2
“ “ Charles Reed, cows,	2
“ “ John L. Hayward, yearling heifers,	2
“ “ “ “ “ calves,	2
Ayrshires,	30

Jerseys.

Abington, Isaac Robbins, cow,	1
“ “ “ bull,	1
“ Col. T. J. Hunt, cow,	1
Bridgewater, Levi L. Goodspeed, bull,	1
“ Nahum Stetson, cows,	3
“ “ “ bull-calf,	1
“ “ “ heifer calf,	1
“ Henry A. Hall, cow,	1
“ Thomas G. Jewett, calf,	1
“ Samuel W. Bates, bull, 1 year,	1
East Abington, Washington Reed, cows,	6
“ “ “ “ bull,	1
“ “ Leonard Blanchard, cow,	1
“ “ Sumner Shaw, cow,	1
East Bridgewater, John Hobart, cow,	1
“ “ Samuel G. Alden, bull,	1
Halifax, E. B. Thompson, heifer, 3 years,	1
“ “ “ bull, 3 “	1
“ “ “ bull-calf, 6 months,	1
Hingham, Theodore R. Glover, cows,	4
“ David Whiton, cows,	4
“ “ “ bull,	1
“ Domick Thompson, cows,	4
“ “ “ bull,	1
“ John R. Brewer, cows,	5

Hingham, Albert Fearing, cows,	3
“ Charles Shute, bull,	1
“ George M. Soule, cow,	1
Joppa Village, Seth Bryant, cows,	4
“ “ “ “ two years,	6
“ “ “ “ yearlings,	5
“ “ “ “ calves,	4
Kingston, Alexander Holmes, bull, 5 years,	1
“ “ “ heifer, 1 year,	1
“ Joseph S. Beal, “ 2 years,	1
Lakeville, Harrison Staples, cows,	3
“ B. Richmond, bull-calf,	1
Marshfield, John T. Dingley, bull,	1
Middleborough, James H. Harlow, cow,	1
“ Jared Pratt's estate, cows,	2
“ “ “ “ calf,	1
“ Augustus Pratt, cow, 3 years,	1
“ Colonel Thomas Weston, cows,	3
North Bridgewater, William L. Field, cow,	1
“ “ “ “ “ heifer, 2 years,	1
“ “ “ “ “ calves,	2
“ “ Rufus S. Noyes, bull,	1
“ “ Wm. A. Thompson, cows,	3
“ “ “ “ “ heifer,	1
“ “ “ “ “ bull,	1
North Marshfield, Leander Sherman, cows,	2
North Plympton, George W. Harrub, bull, 2 years,	1
“ “ “ “ “ heifer, 1 year,	1
Plymouth, Charles G. Davis, cows,	4
“ “ “ “ bull,	1
“ “ “ “ heifer,	1
Rochester, Walter R. Smellie, bull,	1
“ Charles H. Leonard, cow,	1
Scituate, Seth Webb, bull, 4 years,	1
South Abington, Samuel Blake, cows,	2
“ “ “ “ calf,	1
“ “ Martin Stetson, cow,	1
“ “ Isaac Tilson, cow,	1
South Carver, Matthias Ellis, steers, 2 years,	2
“ “ “ “ cow,	1
“ “ Stephen Atwood, heifer, 1 year,	1
“ “ Winslow Pratt, cow,	1

South Carver, George Atwood, bull, 2 years,	1
West Bridgewater, Colonel C. A. Macomber, cows,	6
" " Jonathan Howard, cows,	6
Jerseys,	133

There are other animals of Jersey stock owned in Hingham, and other towns, of which we have no special knowledge, but hope to obtain report hereafter. There are many other very high grades in Hingham, the Bridgewaters, and some of the southerly towns in the county. Perhaps it would be more accurate to state that some of the animals enumerated as owned by Jonathan Howard and Colonel Macomber are graded as high as $\frac{31}{32}$ of Jersey blood. Mr. Isaac Robbins, of Abington, in addition to his pure-bloods, has some very fine Jersey and Shorthorn crosses.

Shorthorns.

We know of but one Shorthorn bull in the county, owned by Mr. Thomas M. Nelson, of Lakeville. Baxter Cobb, of Abington, has two Shorthorn cows; John Lincoln, of Hingham, one cow and calf; David Whiton, of Hingham, one cow; Mrs. Eben Gay, one cow.

Dutch.

Thomas H. Clark, of Plympton, has a Dutch bull, from Mr. Chenery's importation.

Devons.

Nahum M. Tribou, of Middleborough, owns two Devon cows. Although his herd had previously been quite large, and he has been a breeder of Devons for many years, they do not seem to have increased in this county, nor to be in demand in the State. Mr. Tribou has a high graded Jersey bull. F. E. Howard, of West Bridgewater, has a Devon heifer; Charles W. Cushing, of Hingham, has four cows and one bull; David Whiton, of Hingham, one cow.

Kerry Stock.

Charles G. Davis, of Plymouth, has a Kerry bull and cow, and some grade Kerry calves; and Zenas M. Lane, of East

Abington, a bull and two cows. This variety is small, very hardy, and good milkers, and is deemed desirable for the thin lands and woods, farms and pastures of the poorer portions of the county.

Some animals of the Tuscany breed were imported to Scituate a few years ago, but we do not learn that their number has increased. All the thoroughbred stock owned by Mr. Webster, at Marshfield,—Jerseys, Ayrshires and Hungarians,—have been scattered, and it is remarkable that little or no stock of the thoroughbred is found in the towns of Marshfield, Scituate or Duxbury, which are in the immediate vicinity of the Webster farm. The stock in these towns is, however, largely sprinkled with the blood of all these varieties. The grades, now so numerous in the county, will not long be kept up, if the too prevalent habit of farmers of replenishing their herds from the cattle markets, continues in the future as in the past. Hon. James Howard, of West Bridgewater, has some very fine specimens of Jersey and Ayrshire grades of dairy stock, which we trust, he will take pains to keep up to his standard.

Mr. James Copeland, of West Bridgewater, has so long bred-in from selected calves of his own raising, that he thinks, like farmer Sheldon, of Wilmington, that he has a breed of his own on which he can rely.

There is a prevalent opinion that grades of either of the well known varieties of neat stock, are better for our kind of farms and our climate than full-bloods. But we are confident that a continued experience in breeding will dissipate this idea. But what should we do for the pure-bloods if all farmers took this position? Mr. Thompson, of Halifax, a trustee of the agricultural society, states that, with his limited experience of the Jerseys, he finds no truth in the rumor that they are more delicate and require extra care, or better keeping than our native stock. He is a practical farmer of many years' experience with native stock, and is now keeping both, side by side. "If there is any difference," he adds, "the Jerseys are in the best condition." Mr. Thompson thinks that ruta-bagas are the only root-crop, the cultivation of which will pay with him, and that by feeding regularly even an amount not exceeding one-half peck per day to each animal, from Dec. 1st to the middle of May, his stock did better, gave more milk during the season, and would feed cleaner, and relish hay of a poorer quality than he ever knew them before.

Mr. Pratt, of Middleborough, brought up to plain farming with native stock, agrees with Mr. Thompson in his experience of Jersey stock. The profit in breeding blooded animals is so much larger than that from native stock, so called, that we are astonished that our farmers are content with the mere infusion of blood, at least while the demand continues. The expense in all except the first cost is the same in either case, while the difference in profit is very large, compared with the increase of capital.

Swine.

The prevalence of the hog disease in drove animals has rendered the raising of swine of great importance in this county. Many farmers, in some sections, have engaged in it, and yet the demand is but partially supplied at large prices. An infusion of the Chester County blood is generally preferred, and pigs of five weeks old have sold rapidly for $5 to $8 each. In Bridgewater and West Bridgewater more pork is raised than is consumed in those towns, and this is probably the case in some other towns in the county. Hingham is remarkable for the excellence of its hogs, and they have formed one of the most striking portions of the excellent shows of the Hingham Agricultural Society. No product of the farm is more profitable than swine, and the disease in animals brought from Brighton, has benefited rather than injured our farmers. The disease is contagious, and is contracted from diseased animals, and also from the pens in which they have been kept.

Sheep.

There are few sheep of pure blood in the county, but the herds are more largely impregnated with the Southdown and Cotswold, and, in a few instances, with the Oxford Down and Leicester varieties. Owing to the fact that sheep are kept in flocks more or less extensive, and that no farmer has made it a rule to keep a pure-blooded flock by itself, the thoroughbred stock of sheep soon becomes mixed, and although the sheep are improved, it is difficult, except in a very few instances, to declare what sheep are pure.

Mr. Albert Fearing, of Hingham, has two Southdown bucks and twenty ewes, and Alfred C. Hersey one buck; Mr. Davis, of Plymouth, has a few Oxford Down ewes; and Henry Stowell, of Hingham, one buck; and there are some bucks in other parts of the county, claimed to be, respectively, Oxford Down, Cotswold and Leicester; but we cannot vouch for them. Mr. Fearing, of Hingham, has three Shropshire Downs; John R. Brewer, of Hingham, has ten Leicester ewes and one buck; Israel Whitcomb, of Hingham, has a Cotswold buck; and other Cotswolds are owned in that town, which has fine sheep pastures.

The trustees have been informally requested to give in their report some account of the farming in this county, with instances of individual culture or experience. To the citizens of this county this seems hardly necessary. We content ourselves with saying that we believe that more attention is paid to farming, as a separate interest, than heretofore; and there are many instances of successful agricultural industry in the county. The statistics of the industry of Massachusetts will be published this winter by the legislature, from which much valuable information will be obtained. These statistics will show that there is a considerable gain in special products, and in average value of neat stock, and a considerable increase in the number of sheep kept in the county.

The principal crops, in the order of their value, are undoubtedly grass, Indian corn, potatoes, turnips, rye, oats, carrots and barley. The supervisor of crops of the Plymouth County Society writes that "the usual practice with English meadows which require new seeding, if fit for tillage, is to seed with spring grain, after one, two or three years' tillage crops; but that, when ploughed after haying, and seeded down immediately, beneficial results, as well as a mature crop the next season, are obtained." The greatest objection to this latter practice upon our drier upland meadows, arises from the difficulty of ploughing during the dry Augusts which affect this county. A considerable portion of the Indian corn, and nearly all the rye raised, is grown upon pasture land, without special reference to securing a large yield, or to materially improving the soil, but to rid it of bushes and briars, the increased sweetness of the feed after cultivation being one of the objects sought in the operation.

This is a good sign that more attention is paid to stock than has recently been shown.

It may be worthy the attention of our farmers, in some sections of this county, to inquire into the propriety of erecting cheese or butter factories. Such factories have become very common. They save much labor to the farmer, and more to his wife and family; produce an article of uniform quality, and obtain better prices, with a great saving of labor of private sales, than farmers now obtain. If a cheese factory could be started in the neighborhood of Halifax and North Middleborough, or in the vicinity of West and North Bridgewater, with the product, at the outset, of even seventy cows, we think it would pay. A stimulus would be furnished to greater care of land and pastures than is now presented, where milk is not readily sold. The number of cows would soon increase, and the value of farms would rise at once. We trust that some of our friends in those sections will look into the matter closely. Let them visit New Braintree, or Barre, see the operations of their factories, and we doubt not they will soon find a dollar at the bottom of their milk pails.

GRAPES.

The culture of grapes is receiving increased attention in the county. Benjamin Clark, of North Bridgewater, raised 1,700 pounds of hot-house grapes, and Dr. L. B. Puffer, 300 pounds. Nahum Stetson and Thomas Hooper, of Bridgewater, Charles G. Davis, of Plymouth, and John Higgins, of Rochester, some larger amounts, either in cold or hot houses.

But it is to vineyard open culture that we think more attention might well be given. We are told of a crop of fifteen tons of grapes on a single acre, in Concord, in this State, which readily sold for a shilling a pound. The demand will, for many years, largely exceed any possible supply. The trustees will, probably, next year, offer premiums for vineyard culture. During the last two years the Isabella has ripened perfectly throughout this county, with very large, full bunches, and the Deleware grape has proved itself prolific, hardy, and suited to our soil and climate. Hon. Jacob H. Loud, of Plymouth, has a vine of this variety which has borne most prodigally for two years past. Where care is taken of them, the Isabella and the Concord have been successfully cultivated, more especially in Hingham and its neighborhood.

CORN AND ONIONS.

We have few instances of success in particular crops worthy of notice. William L. Field, of North Bridgewater, has raised this year, on eighty-six rods, sixty bushels of shelled corn, ploughing in about four cords of cow manure with a cord and a half of compost in the hills. The hills were three and a half by three feet, four grains in a hill, planted June 10th, and hoed twice. The seed was a mixed variety of swarthy white, a yellow and a flesh-colored corn, and premium crops of more than one hundred bushels for an acre, all weighed and shelled on the first of January, having been harvested under the immediate inspection of officers of the agricultural society. We hear of many successful onion crops in the centre and northerly sections of the county, which are remunerative, notwithstanding the maggot. One man in Bridgewater, last year, raised about eight hundred bushels, but the price of onions has been unaccountably low this fall.

TURNIPS.

We are satisfied that the winter turnips raised in this county, are smoother and sweeter than those of any other county in the State, and are in more demand in the Boston market. No crop brings so much with so little cost, and when they can be sold for sixty to eighty cents per bushel in the Boston market, as has been the case for two years, shrewd farmers will avail themselves of the opportunity to put some of their dry pasture lands in better condition, by turning them up for turnips. The culture of turnips has considerably increased in some of the seaboard towns. The use of bone flour for this purpose is most beneficial, both for the turnips and the pasture, and the bone manure, we believe, is more sure, valuable, and cheap than any artificial manure in the market.

The "Sweet German," the "Yellow Swede" or "Skirving's Yellow," and the "Hanover" turnips, are the favorite varieties. The latter is known elsewhere as the "French" turnip. The name of "Hanover" is hardly known in Boston, but for some unaccountable reason, is so common in this county that many young farmers do not know what seed to call for when purchasing in Boston. A remarkable instance of the disuse into which turnips have fallen as an edible, until, perhaps, within two or three years, is furnished by the fact that the most celebrated caterer in Boston uses the round turnip only, and the "French" or "Hanover" turnip, until within a few years considered the sweetest and best winter turnip in the Old Colony, was hardly known or recognized in the Boston market. It is now surpassed, perhaps, for culinary purposes, by the "Sweet German" only. The "Yellow Swede" is more prolific and more sure, and brings as high a price among the foreign population of Boston. For feeding to cattle, we recommend it to mix with dry hay, in spring and mid-winter, to keep them in good condition, and give them appetite for poorer fodder; but, as a general feed, or fed in large quantities for the purpose of fattening, they are not economical. Mr. Webster used to remark, that turnips, by themselves, were said to be good for nothing; and salt hay, and even black grass, by themselves, were said to be good for nothing; but, at all events, he succeeded in fattening as readily with salt hay and turnips together as with anything he fed to his animals.

In Kingston, Mr. Caleb Bates continues to raise his crop of sweet potatoes, three hundred to five hundred bushels per year, from slips started in hot-beds, besides furnishing slips to others, sufficient, perhaps, to produce, in the aggregate, two or three hundred bushels more. His method of cultivation is to manure heavily on warm, sandy land, and then turn the land into ridges with the plough, setting the slips upon the top of the ridges.

In some towns, owing to the increase of manufacturing industry, the status of farm husbandry is somewhat revolutionary. The former practice of bestowing the most attention upon growing hay for the market has impoverished the farms, prevented improvement of farm stock, and discouraged the farmer. But while many farms are becoming almost a wilderness, and others are becoming divided and sub-divided amongst the foreign element of our population, (who cultivate their little plats more frugally and assiduously, and more productively,) there are those who are trying to resuscitate the farmer's vocation, by adapting their practice to the requirements of our manufacturing villages, which furnish a ready market for all kinds of vegetables, fruits and products of the dairy, thereby spending their hay and grain on their farms. By farming on this principle, Mr. James Howard, of West Bridgewater, writes that his land produces more than twice the number of bushels of corn and wheat and tons of hay per acre, and sustains twice the number of animals, that it did fifteen years ago. He sold $240 worth of onions from one-half acre of land, and his cows have yielded him more than one hundred dollars each in calves, milk and butter, in a year. A farmer in West Bridgewater, with a small farm, sold one thousand dollars' worth of one kind of vegetables the past season. In Carver, Hanson, West Bridgewater and Plymouth, some attention has been turned to raising strawberries for the market, and several hundred dollars' worth are raised in each of these towns.

Few farmers raise corn enough for their own farm consumption, although it is probably the most valuable staple crop, and more easily raised here than elsewhere.

A surplus of potatoes is raised by many farmers, but not enough to supply the consumption of the county. An average yield of this crop for a few years back would not probably exceed one hundred and twenty-five bushels per acre, and more set it at less than that. The writer raised a crop of six hundred baskets, of seventy pounds each, upon two and three-fourths acres during the last season. This was upon old land, ploughed from sod in 1864, and planted in part with corn and in part with turnips, with stable manure ploughed in, and bone flour and ashes at the first hoeing. The potatoes were planted in drills, stable manure ploughed in.

It is a disgrace to the county that asparagus, rhubarb and early vegetables should be imported from Boston; but such is the case. We believe that one hundred farmers might cultivate two acres each of asparagus for the Boston market, with greater profit than any farm product. The soil in the southerly section of the county, near Buzzard's Bay, is light and warm, and the spring climate is much earlier than that of the towns on Massachusetts Bay. It feels the warm eddy of the Gulf Stream, for which the cold current down the coast from Maine is substituted for the towns on our eastern shore. Here early vegetables and the product of the vine might be raised almost as easily as on

Long Island, and the time will yet come, we trust, when some enterprising market gardeners will be found there.

The culture of cranberries is gradually increasing. We do not propose to speak here of the mode of cultivation of the crop, as a full report upon the same was made in a recent report of the transactions of the agricultural society in Plymouth County, and printed with the Agriculture of Massachusetts for year 1864. The crop the last year was more valuable than ever. Near the seashore it needs no flowing to guard from frost, but flooding in winter and early spring is advisable, to prevent the ravages of the worm.

CHAS. G. DAVIS.

MIDDLESEX COUNTY.

Middlesex County has fifty-two towns and cities, and, according to the returns made to the State, has 497,033 acres of land taxed, being more than there is in any other county within the State, except Worcester, which has 909,323 acres, and Berkshire, that has 541,287 acres. The soil is of the various kinds usually found in New England, but sandy and gravelly loams predominate largely; and in many of the towns large quantities of rocks, both in the form of boulders and ledges, are found quite plenty in almost every field.

Of its population, which is larger than that of any other county within the State, not more than one-fifth are engaged directly in agricultural pursuits, the balance being employed in the various manufactures of cotton, wool, shoes, and other articles carried on in the county, or in mercantile pursuits in the cities and large towns within its limits or in Boston. There are quite a number of towns largely engaged in the manufacture of shoes, that do not produce enough of any agricultural product, except, perhaps, milk, in sufficient quantities for their own consumption, and depend to a considerable extent upon the neighboring towns for their supplies.

In our agriculture we must necessarily differ from that of some other portions of the State, from the fact of our proximity to good markets, and perhaps, to some extent, by the nature of the soil. While in Berkshire, Hampden, Franklin and some other counties it undoubtedly is advisable to keep sheep for mutton and wool, and raise cattle for beef, it is very plain that it would not be the best method for Middlesex farmers to adopt; and the reason is evident enough, and it is this—we can and do raise some other crops that pay us better, such as vegetables, fruits and milk, for which there is a constant and increasing demand, and which certainly pay better than wool, mutton or beef. The increased demand for milk alone has caused the farmers to make great improvements on their farms, partly from the fact that now they consume on their farms nearly all their English hay, instead of selling it in the markets of the large towns, and by this process they make much larger quantities of better manure than formerly.

The number of tons of English hay has, within a few years, increased immensely. Take, for instance, the town of Concord. The number of tons of English hay is about two thousand more than in the year 1800, and much the largest portion of this increase has been since the farmers began to sell milk—say within twenty-five years; and I do not suppose that Concord has increased this product more, relatively, than other towns in the county. And in judging of the progress of farming in almost any locality, the increased quantity of English hay will be a good criterion, except in towns devoted to market-gardening, as they usually have the means of procuring manure from the cities in their more immediate vicinity, which they use for other crops that pay better.

Among other questions proposed by me to gentlemen in the different towns, was one as to the condition of the apple orchards, as it is one of our most important products. From Brighton, Lexington, Belmont, Somerville, Newton, Watertown, West Cambridge, Cambridge and Winchester, the orchards are reported as worthless, and in many instances are being dug up by the roots. In Framingham, Woburn, Burlington, Dunstable, Waltham, Weston, Carlisle, Wayland and South Reading, as failing. In Bedford, Acton, Littleton, Billerica, Boxborough, Lincoln, Groton, Stow, Sherborn and Westford as in good condition. In some of the other towns as not improving. But from all the towns it is stated that it is much more difficult to raise apples than formerly, from the great increase of insects, and perhaps some other unknown causes, as, for instance, the occurrence of a thunder storm while the trees are in blossom. As the production of apples is a very large and important interest in this State, as well as in the county, any practical method of preventing the ravages of insects would be of great value.

The pears have increased as much, perhaps, in proportion, as the apples have fallen off, and every year there are large numbers of trees planted out, both in gardens and orchards, and there are annually large quantities of this fine fruit sold, which is raised principally in the lower part of the county. The city of Cambridge is probably the largest pear-growing town in New England, producing five thousand bushels annually, and increasing the quantity each year. I also find that, in fourteen towns, there are at least fifty-three acres of hardy grapes, planted for vineyard culture. This estimate does not include any lots of less than one-fourth of an acre.

In the town of Concord there are sixteen acres, and in Acton, nine acres, and in these and many other towns there are preparations making for planting extensively next spring.

Nineteen towns report one hundred and twenty acres of strawberries. Belmont alone has twenty-five acres, and five acres of raspberries. Of vegetables, West Cambridge has six hundred acres of land in market gardening; value of the product, $180,000. Watertown, eighty-eight acres; value $39,950. Newton one hundred and eighty acres. Other towns are in the same business to considerable extent, and in some eight or ten of them it is the leading product. Cucumbers are grown for pickles to considerable extent in Lincoln, which had last year one hundred acres; also in Burlington, Lexington, Weston, Waltham, Concord, Bedford and other towns. Crop, from one hundred to one hundred and thirty thousand to an acre. Price, $1.40 per thousand, delivered in Boston or Charlestown, and usually contracted for by the pickle dealers previous to planting. This crop is not considered an exhausting one.

Cranberries are raised to considerable extent throughout the entire county. Sherborn alone sold two thousand barrels last year.

Twenty towns report two thousand two hundred and sixty-three sheep. With only two exceptions, they are reported as not profitable. Two flocks in the above estimate, containing four hundred and fifty head, have been sold within a short time, their owners being determined to get rid of them, as they are satisfied they can use their pastures and hay in a more profitable manner.

There are about twenty-five towns in which the production of milk to sell is the leading pursuit. Seventeen of these towns I have full returns from in regard to this product. I find that there was 2,302,691 gallons sold in 1865. The average price received by the farmers was about twenty-one cents a gallon, which would amount to $483,565.11 in the seventeen towns. This does not include the amount consumed within the towns for making butter, cheese, fattening large quantities of veal, and for family use. Some of the towns return as much as $8,000 a year for the veal alone. I am also very certain that the amount of milk sold is really much more than the amount returned, as I find that the large milk dealers are unwilling to give much information on the subject, and are desirous to represent their business as small as possible.

These same towns also produce large quantities of fruit, vegetables, pork and beef, which are sold in the cities; and they supply many small manufacturing establishments within their own borders. In these seventeen towns there are 9,974 cows—about three-fourths in milk. The high price of cows has awakened the attention of farmers to the importance of raising more stock, and there have been more heifers than usual raised the last year. Still, there have not been as many as the high prices would seem to warrant.

In twenty-four towns there are 225 full blood Jersey cattle, 74 Ayrshires, 31 Durhams, 18 Dutch. These comprise all the principal stocks within the county. Still, there are quite a number of scattering full-blood animals, not enumerated in the accompanying list, mostly owned in the vicinity of Boston. There are also a large number of grade animals, more particularly of the Jerseys and Ayrshires, which are very generally distributed about the county.

LIST OF BLOOD ANIMALS—NEAT STOCK.

Town.	NAME.	Jerseys.	Ayrshire.	Durham.	Dutch.
Belmont, . . .	W. W. Chenery, ...	2	–	–	18
" . . .	Heirs of John P. Cushing, .	20	–	–	–
" . . .	Mrs. James Brown, . .	3	–	–	–
Littleton, . .	J. H. Whitcomb, ...	–	1	–	–
" . . .	J. S. Hartwell, . . .	1	–	–	–
" . . .	W. H. Hartwell, . . .	1	–	–	–
Lowell, . . .	Peter Lawson, . . .	1	–	–	–
" . . .	Ransom Reed, . . .	1	–	–	–
Medford, . .	Peter C. Brooks, Jr., . .	10	–	–	–
" . . .	F. Brooks, ...	5	–	–	–
Newton, . . .	G. Frost, ...	8	–	–	–
Somerville, . .	– –	6	–	–	–
Stow, . . .	Francis Warren, . . .	1	–	–	–
Sudbury, . .	Mr. Thompson, . . .	–	2	–	–
Tewksbury, . .	E. M. Read, ...	8	–	–	–
" . . .	Mr. Kittredge, . . .	4	–	–	–
" . . .	H. C. Merriam, . . .	–	–	5	–
Waltham, . .	George W. Lyman, . .	2	16	–	–
" . . .	Theophilus Walker, . .	–	4	–	–
" . . .	F. C. Lowell, . . .	3	–	–	–
" . . .	S. D. Warren, . . .	4	–	–	–
" . . .	William Bright, . . .	–	–	1	–
Bedford, . . .	John Clifton, . . .	5	3	–	–
Brighton, . .	David Nevins, . . .	10	–	–	–
Chelmsford, . .	Amos B. French, . . .	10	–	–	–
Concord, . .	J. L. Hurd, ...	23	–	–	–
" . . .	Joseph Holbrook, . . .	2	–	–	–
" . . .	John S. Keyes, . . .	6	–	–	–
" . . .	Wm. G. Barrett, . . .	2	–	–	–
" . . .	John B. Moore, . . .	9	–	–	–
" . . .	George M. Barrett, . .	–	14	–	–
" . . .	Abiel H. Wheeler, . .	–	4	–	–
Dunstable, . .	Z. B. Procter, ...	–	–	5	–

List of Blood Animals—Continued.

Town.	NAME.	Jerseys.	Ayrshire.	Durham.	Dutch.
Framingham, . .	Abiel S. Lewis, ...	–	6	–	–
" . .	E. F. Bowditch, ...	15	–	–	–
" . .	H. G. White, ...	–	–	19	–
" . .	F. A. Billings, ...	–	6	–	–
" . .	G. H. Thompson, ...	–	6	–	–
" . .	10 others scattered in town. .	–	–	–	–
Groton, . . .	George S. Boutwell, . .	8	7	–	–
Lexington, . .	James S. Munroe, . .	8	–	–	–
" . .	Mr. Muzzey, ...	2	–	–	–
" . .	Morris Fines, ...	1	–	–	–
" . .	R. D. Blinn, ...	1	–	–	–
Watertown, . .	R. D. Denney, ...	4	–	–	–
West Cambridge, .	James C. Converse, . .	12	–	–	–
" " .	J. R. Bailey, ...	2	–	–	–
" " .	D. S. Brown, ...	2	–	–	–
Westford, . .	E. A. Bunce, ...	1	–	–	–
Weston, . . .	F. T. Bush, ...	6	–	–	–
" . . .	James Case, ...	4	–	–	–
" . . .	Benjamin Pierce, . . .	–	5	–	–
Hopkinton, . .	H. L. Bowker, ...	12	–	–	–
Sherborn, . .	– –	4	–	1	–
		225	74	31	18

In twenty-four towns,	Jerseys, ...	225
	Ayrshires, ...	74
	Durhams, ...	31
	Dutch, ...	18
Eight towns none.		
Total, ...		348

JOHN B. MOORE.

WORCESTER.

The first effort made for the improvement of the neat stock of Worcester County, of which I have any knowledge, was the present of an imported bull and cow from Christopher Gore to Levi Lincoln, about the year 1800. These cattle were called the "Teeswater breed," but whether they were full-blood or grades, I have no means of knowing. They no doubt gave the first impulse to the improvement of the neat stock of the county. They are described as red in color, with some white spots, horns short, good size, and the cows were remarkably good milkers.

In 1817, Stephen Williams, of Northborough, imported the bull "Denton," (963,) in color red roan, weighing, at three years old, 1,862 pounds. This was probably the first herd-book animal of the Shorthorn breed imported into Massachusetts. In 1822, Mr. Williams imported the cow "Arabella," by "North Star," (460,) bred by the celebrated English breeder, John Wetherell. "Arabella" produced several heifers, viz., "Yellow Rose," "Miranda," "Lilac," "Nonpareil," all by "Denton," (963;) also "Albert," by "Admiral," (1,608;) bulls "American Comet," (1,638,) by "Denton;" "Sultan," (2,709,) by "Frederick," (2,038;) "Splendid," (2,692,) by "Frederick," (2,083;) and "Albion," by "Patriot," (2,412.) "Wycomet," (1,591,) another Shorthorn, was sent to Roswell Converse, of New Braintree," by Colonel Allen, of Connecticut, and kept there from about 1822 to 1826.

These animals were all recorded in Coate's English Shorthorn herd-book, and many of the Shorthorns of this county trace their pedigree to these animals. Their grades were numerous, and gave a strong impulse to improvement. About 1818, Gorham Parsons imported a bull called "Holderness," bred by George Faulkner, Yorkshire, England. He had no pedigree, but was warranted thoroughbred. Some of his descendants, probably grades, were brought to this county, and did much to raise the character of our native stock. Their color was light red and white, often line back. They are readily identified by the visitors to our cattle shows.

About the year 1823, Sir Isaac Coffin presented to the Massachusetts Society for Promoting Agriculture the bull "Admiral," (1608,) also bred by John Wetherell, and sired by "North Star," (460.) This bull (Admiral,) was kept in Worcester for some time, and probably left his mark. I know of no other thoroughbred Shorthorn cattle that were kept and owned in this county that do not belong to the Williams stock, until 1843, when John

Wells presented a bull to the Westborough Agricultural Society, but without a pedigree. The same year William Cushman, of New Braintree, owned bull "Boz," (280.) "Boz" was of the Williams stock. The same year, Elias Ayers and William Broad, of Barre, owned the bull "Young Monarch," (106,) bred by C. H. Hall, New York. In 1844, Mr. Ayers owned the bull "Hawthorn," (74,) also bred by Mr. Hall. There was also another bull, "Duke," (54,) bred by E. P. Prentice, of New York. These last four named bulls have done much to produce that splendid cheese dairy stock of Barre and vicinity. The dairy farmers of that neighborhood still use thoroughbred bulls for their dairy cows, and I think, and they have no doubt, to their advantage. There are also several thoroughbred cows now owned in that vicinity. The principal breeders of the Shorthorns in the county at the present time are Messrs. Wood, Commins and Holman, of Grass Hill, Millbury; William Cushman, of New Braintree; State Lunatic Hospital, Worcester, and F. M. Wood, of Grafton.

AYRSHIRES.

Some five fine specimens were imported by the Massachusetts Society—four cows and one bull—in 1845, and about the same time, by Captain Randall, of New Bedford. In the year 1849, the society sent a bull, called "McGregor," to the Worcester society. He was kept for some time in Worcester, at the farm of Hon. John W. Lincoln. Mr. Lincoln, about the same time, procured from the New Bedford herd one or more heifers. These animals formed the nucleus of the herd now owned by B. J. Stone, of Sturbridge; also that of Gen. Lyman, in the vicinity of Boston, of O. B. Hadwen, of Worcester, and, in a measure, that of Dr. Loring, of Salem. The more recent importations of the same society have not added much to the value of the neat stock of the county, with here and there an exception. Mr. H. H. Peters, in 1858, imported some twenty-five head of choice animals, which have since been scattered through the country. But few of the seventy to eighty which were sold at his public sale, in the spring of 1865, were retained in the county.

JERSEYS.

Of this promising breed we have in the county several herds and many small lots. The principal breeders are Gen. William S. Lincoln and O. B. Hadwin, of Worcester, Jonathan Forbush, of Bolton, and John Brooks, of Princeton. The foundation of these herds was the animals imported by the State society, and from the herd imported by John P. Cushing.

DEVONS.

This handsome breed of cattle has been introduced to a small extent into this county, but has been mostly crossed with our native stock. Probably not more than half a dozen animals are now owned in the county that would be received into the herd-book. We think we risk nothing in saying the Shorthorns have done more for grading than all the other breeds put together. But, on the other hand, there are as many thoroughbreds of either the Ayrshires or the Jerseys as there are of Shorthorns.

H. R. KEITH.

WORCESTER NORTH.

The principal crops raised in Worcester North are hay, corn, potatoes, wheat, rye, barley and oats, fruit and vegetables. Where the land is suitable, rye is a profitable crop, as the straw sells readily at from two-thirds to three-fourths the price of good hay. Much more attention is paid to the cultivation of vegetables than formerly, in consequence of the increased demand for them in the villages, and the farmers get a much better return than for the usual farm crops. Many have commenced the cultivation of the grape, which bids fair to become a profitable crop. Many orchards of pear trees are started, and much more time is spent in the cultivation of strawberries and other small fruits. This section is largely engaged in the manufacture of chairs, tubs and pails, paper, edge tools, sashes and blinds, agricultural implements, machinery, &c., consequently, making a good market for the various products of the farm.

But little cheese is manufactured. The butter is generally marketed near home. Many farmers are engaged in raising milk, to be sold in the villages or sent to the Boston market. If it does not pay as well it is less labor than to manufacture butter and cheese.

Corn, planted or sown for fodder, is raised by many of the dairymen, and is a profitable crop, particularly the past season, when our pastures were literally burned up with the drought. I think we never had a season when so much fodder was fed from the barn, in the months of October and November, as the past. Owing to the high price of hay, and cattle, and labor, many farmers have disposed of most of their stock, sold their hay, and though it may have the appearance of making money, (if they stay upon their farms,) will find in the end that it was not a profitable operation.

We have only one herd of thoroughbred animals in Worcester North, to my knowledge, and that is a herd of Jerseys, owned by John Brooks, of Princeton. There are some thoroughbred males. At the town farm, in Fitchburg, we have a fine Shorthorn, raised by Wells Lathrop, of South Hadley. Capt. James Upton, has a pure Shorthorn; Nathan Caswell has a Jersey; Lyman Nichols has a Shorthorn and an Ayrshire, also an Ayrshire cow, from the herd of Mr. Peters; Timothy Clark, of Royalston, has a Shorthorn bull; Augustus Whitman, of Fitchburg, has a few thoroughbred Shorthorns. There are many grade animals of the different breeds, and people are beginning to appreciate the services of thoroughbred males, so that our stock shows evident signs of improvement.

Abel F. Adams.

WORCESTER SOUTH.

In accordance with the vote of the Board of Agriculture, at Worcester, I will give you what of special interest has fallen under my observation, and such facts as I have been able to obtain from other sources within the limits of the Worcester South Agricultural Society. From year to year there seems to be an increasing interest in the raising and procuring of such stock as is best suited to the various localities, and to the particular farm on which the stock is to be kept. If we should raise the large Durham cattle, and find that particular kind of stock a source of profit, it is very evident that it must be a very productive farm. If, as is the case on many of the farms, the product of the pastures is not sufficient for the larger breeds to obtain a supply of food without a continual cropping from morning till night, then it becomes the farmer to look for something more hardy, and better suited to his particular farm. One farmer tells us that the Durham stock is far preferable for profit; another, the Ayrshire; another, the Devon; another, the Hereford; another, the Jersey; and still another says, give me the real native stock in preference to all others. Now, all may be correct in their statements, and give the kind of stock best adapted to their particular locality, or farm, or mode of keeping. But, before we decide to adopt any particular one of them, we must take into account what I have before stated.

Within the limits of the Worcester South there is a sprinkling of grade stock of most of the various breeds raised in New England. The only pure bloods I know of are seventeen head of Ayrshires, owned by Bela J. Stone, of Sturbridge; twelve head of Ayrshires and five of Jerseys, owned by the Hamilton Woollen Company, of Southbridge; J. A. Rich, of Charlton, five head of Ayrshires; Col. Capen, of Charlton, one Durham bull; William Hammond, of Charlton, one Durham cow; Simon Carpenter, of Charlton, one Durham bull; Waldo M. Healey, of Dudley, six head of Devons; S. F. Marsh and Nathaniel Upham, of Sturbridge, have Devon stock, but I do not know that there are any pure bloods. There probably are some others, but these are all I know of at present, but am confident the number will increase from year to year.

The Worcester South Agricultural Society was organized eleven years since, and the interest manifested from one year to another seems evidently to be on the increase, as shown by the exhibitions and the number of persons attending them. The past year has been one of general prosperity within the limits of the society in its farming interests, although the extreme dry weather cut short some of the products. The hay crop, which is an important one, was a fair average, the dry weather not coming as early as the year previous. Large quantities of grain are not raised; the income, to a great extent, being from the dairy,—or stock in some way,—so that the attention of the farmer is turned more particularly to this branch of farming.

There are two cheese factories established within the limits of this society. One of them is in Brookfield, the other in Warren; the latter taking the milk of four hundred and fifty cows, from the north part of Brimfield and the south part of Warren. There was made, from the first week in April to the second week in October, 1,760 cheeses, weighing 131,379 pounds after being sufficiently cured for market, and bringing an average of \$16.83½ per hundred, amounting to \$22,118.70. Expense of manufacturing, materials used, and interest on capital invested, \$3,185.59, or about two cents four and a half mills per pound, leaving a net income to the farmers of \$18,933.11, or \$14.41$\frac{1}{10}$ per hundred. This includes no estimate for the whey, which is probably worth, to feed to hogs, about three dollars per cow.

Cheese factories, in New England, are of recent origin, but enough are in operation to show that this is the true way of making cheese, and that there is a great economy of labor, averaging not more than one person for the milk of one hundred cows. We commend this mode of operation to the careful attention of all interested in cheese-making.

Personal experiments in farming have been called for. I can give but few. I raised, the past season, on one hundred and thirty-three rods of ground, twenty-four and one-half bushels of wheat, which was considered worthy of a premium, as a field crop. No manure was used specially for the wheat crop. The land was well manured the previous year, all being spread on and ploughed in, and cabbage and turnips grown upon it. I find, so far as my own experience goes, that it is better for crops to spread on the manure in the autumn, and plough in. One advantage of this mode of operation is, that the land can be worked earlier in the spring; another is, as I have said, I think it is better for the crops. New England is the great workshop for the mechanic arts, and for manufacturing, and the attention seems to be drawn to a great extent from her agricultural interests. We often hear the complaint, by those not engaged in producing what we all need, that the products of the farm are so high in price that they can hardly obtain enough for a livelihood, and that the farmers are reaping a rich harvest. One of two things must be true,—either they do not believe it is so remunerative, or they think they can obtain a livelihood in some other way with less labor. Let not such complain of the high price of provisions, but turn their steps in that direction.

Agriculturists have been slow to avail themselves of all the improvements in implements, and the use of machinery in cultivating their farms. But for a few years past there seems to be a greater tendency in that direction. The mechanic and manufacturer are sure to avail themselves of all these advantages, and the farmer finds that, in order to keep pace with them, he must avail himself of all these helps, thereby rendering farming more easy, pleasant, and remunerative, thus tending to invite, rather than repel, young men from the farm. The farm, with all its surroundings, should be made pleasant and attractive.

There seems to be an increasing interest in the production of fruit. Many are realizing that this has not received its due share of attention. The idea with many has been that if fruit trees were only procured and set, they would require no further attention. This idea is, to a great extent, dispelled, and more attention is given to the production of nice fruit, which is a source of profit, as well as a great luxury. No one thinks of planting a field of corn without first preparing the ground, and giving it careful attention during the entire season. Fruit trees also need their share of attention, as well as all other crops.

I regret that the requisition for facts regarding the agricultural interests of my particular locality came too late to give me such opportunity as I should desire, but hope in future to be more definite.

NEWTON S. HUBBARD.

HAMPSHIRE.

The following report on the agriculture of Hampshire County, is, of necessity, made up only in part from personal observation, and this the more limited from the fact that the writer has been absent for some months in the summer season:

Grass being the foundation of Massachusetts husbandry, it deserves the first notice. This crop, especially the first cutting, was unusually good. The almost universal use of the mower and horse-rake, and, to some extent, the tedder and horse pitchfork, have come to make the harvesting of this crop comparatively a pastime; and yet, with all these facilities, the price is much higher than it used to be. This year it ranges from eighteen to twenty-five dollars per ton.

The corn crop was good, but not quite equal to last year, the drought ripening up the crop prematurely in some instances.

Potatoes are good in quality and size, but the crop is not as large as last year.

More broom-corn was planted than last year, and the crop was fair—in some instances large and the seed remarkably fine.

Some fields have yielded near a hundred bushels per acre, and the weight has gone as high as forty-three pounds per bushel.

The quality of tobacco is said to be not as good as last year, owing to premature ripening; and the same cause, it is thought, will show a falling off in the weight. There was less set than last year.

Of onions there was a greater breadth planted in this vicinity than ever before. The price started at two dollars, but soon ran down to sixty or seventy cents, where it has remained. It is the opinion of some growers that, even at this price, they can be profitably raised. The crop has been fair in quantity where properly cultivated, but somewhat deficient in quality. This is attributed by some to poor seed, but it is quite likely, as in other cases, it was owing to imperfect ripening.

In regard to fruit my observation has been limited. As far as it extends, among apples the Roxbury russets have resisted the adverse influence that has affected them better than most other kinds. Cherries, in our vicinity, have shared the common fate. The only fruit I have seen the past season was grown upon native or ungrafted trees. Is it not possible that this delicious fruit needs regenerating by a new supply of seedlings?

Of other fruits, strawberries are being more and more cultivated, and the demand for them, as a market fruit, keeps pace with the increase. Pears and grapes are receiving more attention. Of the latter, the Delaware and the Concord seem to promise the best. The Delaware, in particular, I have heard favorable accounts of in a number of instances, and I should not be surprised if it proved a great favorite in the Connecticut River Valley.

The effort made, a few years since, to introduce the cultivation of sorghum has not been productive of marked results. Still, it seems to have left a germ which may ripen into permanent and extensive good. In the town of Hadley there are two or three individuals who have raised it on a small scale, and with good success. The accommodations for the manufacture are only a cheaply constructed mill, operated by horse-power, for expressing the juice, and a common boiler for reducing it to sirup; yet, with these rude appliances, they get at the rate of 160 gallons to the acre, which sells readily at one dollar per gallon.

There is an establishment for the manufacture of sirup at Westbrook, Hatfield, and also one at Deerfield. With regard to the latter, I have the following facts: The cost of mill, boilers, &c., is about $500. It has made nearly five hundred gallons of sirup. The yield is from twenty-five to one hundred and fifty gallons per acre, and the cost of the manufacture thirty cents a gallon. This is a fair result, and affords ground for the presumption that the interest may yet become an important one. It would not be more strange than the fact that within seventy-five years the broom business has grown from nothing to its present dimensions. The first half acre raised for brooms was grown in Hadley, by one Levi Dickinson, in 1798.

On the west side of the river, in the towns of Hatfield, Whately and South Deerfield, the cultivation of the Myatt plant for making wine has been receiving some attention for a few years past. Large stories were told at first of the profitableness of the crop, which a further trial does not seem to justify. At present it seems to be getting out of favor, and I hear that some are ploughing up their plantations in disgust. It seems doubtful whether there is any plant that produces a juice, requiring a large amount of sugar to convert it into a wine that will keep, that should be regarded with much favor. When we can produce a grape with enough of saccharine matter in its juice to preserve it, we may safely go into the business of wine-making without fear of increasing intemperance.

With regard to stock, the farmers of the Connecticut Valley are differently situated from those in other parts of the State. The scarcity of pasturage, or of such lands as are usually devoted to it, makes the raising of young stock, or indeed the keeping of much stock of any kind through the summer season, rather inconvenient. It is the more common practice here to buy in the fall enough of cows, steers or oxen to consume their produce, and sell again in the spring.

Within a few years the system of farming has become very much changed. Twenty-five or thirty years since probably very little, if any, grain was brought into this section. On the contrary, large quantities were taken off to the neighboring towns among the hills, while the amount consumed in making beef and pork was quite as large as at present. This, at least, is my impression, though I have no data with which to prove it. Since the introduction of tobacco raising, not only is all the grain raised by the farmers used, but large quantities are imported. There have been received, at the Northampton depot alone, the past year, nearly 50,000 bushels of corn. This must be attributed in part, however, to the increase of manufactures of various kinds in our vicinity.

Feeding is carried on in many instances without much regard to profit. At least it is often a secondary consideration, the main object being a supply of manure for the tobacco crop. This necessity has led to a great demand for hay, to such an extent, indeed, that baled hay from abroad is beginning to be used. In addition to this, concentrated manures are largely used. Of the various kinds, probably Hampshire County disposes of not less than a thousand tons a year. Expensive as this system of manuring is, at present prices it pays; but if the tobacco crop should fail, or prices fall, it is difficult to conceive what the farmers would have to fall back upon.

There is but little of full blooded stock in this immediate neighborhood. The herds of Messrs. Lathrop, of South Hadley, and William Smith, of Northampton, are too well known to need any description here. These, with the fine herd of Ayrshire cattle and Southdown sheep owned by Luke Sweetser, Esq., of Amherst, constitute the choicest specimens of their kinds, and I believe are the principal herds in Hampshire County.

If I were requested to point out a pattern farm, all of whose operations are well balanced, where no crop is cultivated at the expense of others, but the grand object is the highest condition of every field, where neatness, order, thrift and independence are obvious to the most careless observer, I should not have to go beyond the limits of my own town. It lies upon its eastern verge, has an eastern exposure, being separated from the alluvial portion of the town by a considerable elevation. Mr. Green (the owner of the farm,) began his farming operations about forty years since, with the purchase of a tract of twelve acres of brush pasture, to which, the next year, he added a tract of woodland, of thirty-six acres. This he cleared off and brought into cultivation at once. Since then he has been making additions, until now, he, with his two sons, who are settled around him, have over two hundred acres under their skilful management. He is a successful farmer, and if his success has been gradual, it has been all the more sure. It is not a result of the cultivation of what, for the want of a better term, I shall call special crops, that is, cultivated crops that are relied upon as the chief income of the farm,—such as broom-corn or tobacco. He has practised, from the first, a mixed husbandry, directing his efforts constantly to the production of the greatest quantity of grass and the different kinds of grain, not for sale to much extent until converted into beef, pork, mutton, butter, cheese, etc. He raises his own stock chiefly, and in this way avoids something of the disappointment of his neighbors, who, after feeding their stock through the winter, are sometimes compelled to sell for little or nothing more than they gave for it the previous autumn. Of late he has added a flock of sheep to his other stock, principally for the purpose of raising lambs for the market. His sheep and cattle, though chiefly grades, are bred with great care and skill, and with reference to the special purposes for which they are designed. The milking qualities of his ewes are as carefully regarded as his cows, and, as he claims, with quite as much reason. The readiness with which his stock is taken by the butchers shows the success to which he has attained, both as a breeder and feeder.

Mr. Green dates his first marked success in agricultural operations from the time when he began the use of lime.

He became interested in a kiln in Whately, some six or eight miles distant, and for several years used it largely. Its effect was very marked, in bringing in white and red clover, while the grain raised by him was almost uniformly better than that of his neighbors, who used no lime.

This, with plaster, is the only fertilizer that has ever been used, except what is made upon the farm. Of late, he has substituted oyster shell for the Whately lime. Clearly perceiving that with his system the amount of his income would depend in great measure upon the amount of grass that he could raise, he made this a matter of the first importance, and finding his own experience to corroborate the assertion that manured land will produce a much more nutritious hay than unmanured, he commenced and has followed the practice of top-dressing, until he now has in permanent meadow a lot of twenty acres, which, for the quality and quantity of its produce, is probably not often equalled by any of the grass lands of the low river valley.

The use of lime as a fertilizer has long been a mooted question. It is well known that the late Mr. Buckminster, of the "Massachusetts Ploughman," had no faith in it, and was always ready to argue against its use, while others, quite as intelligent, and with the advantage of science on their side, have held the opposite opinion.

I consider Mr. Green's experience and observation so peculiar and valuable as throwing a light on this point, that I presume I shall be pardoned for occupying a few moments with a more particular account of it. The land on which he settled was not natural grass land, at least much of it was not, and his first chief study was, as it has been ever since, to improve it in this respect. He made but little manure at first, and that wanted for the planting ground. He had heard of the use of plaster, and knew its effect. On the plain lands, in the north part of the town, the farmers have had wonderful success with it for awhile, but at length it ceased to operate, and left the land in worse condition than at first. Consequently, at the time of which I am speaking, it had grown out of favor and was not used at all in the neighborhood. Mr. Green resolved to try it. His first purchase was five hundred pounds, for which he had to go some twelve miles down the river. Its effect was most marked. He cut great crops; but being determined to avoid the error of his neighbors in allowing his land to get reduced, he applied, every year or two, a strawy barnyard manure. He followed this practice on *the same piece of ground* for eighteen years, at the end of which time, to use his own words, "he found himself against a stump." His lots had become a bed of *moss*, the little grass that grew being thin and short. He had proved one fertilizer, and though disappointed, nothing daunted, he determined to try another. He decided upon lime, used it, and in two years the moss had disappeared, and he was cutting fine crops of grass. Since then he has used lime constantly and largely, until his whole farm has been brought to a pitch of excellence not often reached. His present method of using it is usually composted with earth and manure, and is somewhat as follows. He has two receptacles for the manure, viz.: the cellar and the barnyard. Both are well supplied with absorbants, generally earth. After planting, the whole is worked over, and with the cellar manure is mixed about a hundred pounds of plaster to five or six loads of compost, while the yard manure gets double that quantity of lime. The yard manure is worked over twice during the summer, and that in the cellar three times. In the autumn it is hauled out, the permanent grass lands receiving a dressing every year equal to five or six ox-cart loads per acre, and distributed in such a way that the part that gets the plaster compost this year shall have the lime next. Mr. Green thinks a light dressing every year better than a heavy one once in two or three years. He tells me that the lot on which he first experimented with plaster, though it has been down forty years, is still cutting two crops, and yielding three tons to the acre. On such lands as are not in permanent mowing, a rotation system is pursued, corn being the first crop and oats or rye the second, seeding with white and red clover and timothy, after which it lies in mowing or pasture until it needs breaking up again. For the corn crop, the same manure is used as for grass, at the rate of twelve or fifteen loads per acre, and applied in the hill. This for his sheep pastures. Those on which the cows are fed receive an additional dressing of green manure, to make up for the loss occasioned by the yarding of cows over night. I mention this to show what care is taken that no field shall suffer from overcropping. To sum up, there are three points that attest the value of lime and its use, as adopted by Mr. Green.

1. One of the chief of these, as it seems to me, is the greater economy in feeding and fattening stock; for while other feeders are giving ten or twelve quarts per head of Indian meal, he gives but eight or nine of a provender made of equal parts of corn and oats. The difference is in the quality of the hay, for there is no dispute as to that of the beef he makes.

2. Another point, is the yield he gets per acre of the various crops. An average of fifty bushels of corn and the same of oats, with two and three tons of hay, is not common; but it is reached here. I happen to know of one field of sixteen acres that produced more than eight hundred bushels; another of six acres that averaged sixty bushels; and another, a field of sixteen acres of corn grown upon a sheep pasture that was estimated at eight hundred bushels.

3. Then his general success bears witness in the same direction. Mr. Green began with $150, left him by his father. He has settled two of his sons near him, with comfortable buildings

and thirty acres of land each. He has educated one or two sons at college, and still holds over 150 acres, perhaps none of which now would sell for less than a hundred dollars per acre.

Such success, however, is not to be calculated in dollars and cents. It has an intrinsic value to him who has achieved it, while as an example of an original, discriminating mind, working out, through long years of uncertainty, its own agricultural problem, it is worth tenfold its cost in money.

An obvious reflection, too, is the fact that this wealth is created. An entire community might do as he has done. There has been no robbing of the western prairies, the islands of the Pacific, nor the treasures of the sea. He has used but the solid rocks of New England or Nova Scotia for his fertilizers, and with these he has so manipulated, that every successive addition to his acres seemed to feel the magic of his influence, and spring almost at once from an ordinary condition into unwonted fertility.

T. G. HUNTINGTON.

HAMPDEN.

The soil of Hampden County consists of the rich alluvial meadows bordering upon the Connecticut and Westfield Rivers, the light sand plains which lie in close proximity to these alluvial lands, (particularly upon the east of the Connecticut,) and the hard granitic soils which prevail at a greater distance; the two latter constituting far the largest area.

From the facilities of public communication, and from other causes, the valleys are most frequently visited, and best known; and an estimate of its agricultural resources, founded on this partial view, is much beyond its real merit.

The Connecticut Valley at this point is about one mile in width, while beyond, the surface rises more or less abruptly, and you come upon the level plain upon the east, or the more broken and somewhat mountainous surface on the west. A soil thus diversified requires, of course, equal diversity of tillage and farm management. To devote these rich, arable lands, mainly to permanent pasture, would be no less absurd, than for those occupying the higher, and more sterile portions, to go extensively into a system of soiling and grain producing.

Whatever *theory* may claim, the wise and skilful farmer will first adapt his crops to the soil he has to deal with; and then, by judicious cultivation, will endeavor to adapt the soil more fully and perfectly to the production of such crops as he finds most suitable and profitable.

Bordering the Connecticut on the west, are the towns of Agawam, West Springfield and Holyoke. On the east, Chicopee, Longmeadow, and the city of Springfield. Westfield may also be considered a valley town, lying, as it does, upon both sides of the river bearing the same name.

The above named towns, considering soil and market facilities, are, perhaps, the most highly favored, being composed, in part, of the most beautiful and productive land to be desired; while another, if not the larger portion, presents the opposite extreme, being a light, sandy soil. The agricultural products in these towns are, in part, hay, corn, tobacco, rye, potatoes, cabbage, onions, and other vegetables. Market gardening is carried on to a considerable extent, particularly in West Springfield, and Chicopee, and with satisfactory results. Many farmers who give no attention to general gardening, raise from one to three acres of cabbage. This is readily disposed of to consumers in adjoining villages and cities, or purchased by middle men and shipped to Boston, Worcester, New Haven, and other cities. This is considered a paying crop, the producer often receiving two hundred dollars per acre for the crop before harvesting.

Tobacco has become one of the staples of the Connecticut Valley, being grown to greater or less extent in every town, and probably with larger profits per acre than any other crop; certainly with larger gross receipts, four to five hundred dollars being no uncommon sum realized for the crop from one acre. I think the average weight for this county is 1,600 pounds, yet 2,000 pounds and more are often obtained.

Corn is one of our valuable and most reliable crops, the number of bushels per acre ranging from 20 to 90, with an average of 40.

The light, sandy land, which in Hampden County prevails, (particularly upon the east side of the river, commencing from one-half mile to one mile from the bank,) is devoted mainly to the production of rye, an average crop of which is nine bushels grown every third year. Some lands of this class have of late been planted to corn; and by the use of some *special* fertilizers produce twenty to thirty bushels per acre. In regard to this class of *manures*, it is true that upon these light lands they usually produce far better results than upon heavier and richer soil.

The grass crop is of the first importance, considering its cost, whether it be for market, or for consumption upon the farm. An average crop may be one and one-half tons per acre.

Hampden County is not favored with flowed meadows, to the extent of the sections lying north of us. Yet by manuring for tobacco and other crops, and by frequent re-seeding, heavy crops are often obtained.

The stock in the towns near market, beside teams for doing the farm work, (which is done mostly by horses,) is cows, for the production of milk. Few of these are bred here, and consequently are of no particular type or breed. Each of the pure-breeds are represented to some extent within the county.

I have not succeeded in obtaining the number of thoroughbred animals in the county, or a full list of breeders and owners of such stock. The Devons are bred in Wilbraham by Messrs. H. M. Sessions, and D. B. Merrick, who now have about fifteen head each. William Birnie, of Springfield, is the largest breeder of Ayrshires, having a fine herd, numbering, at this time, forty. Messrs. M. S. Kellogg, and H. O. Chapin, of Chicopee, each have fine animals of this breed. Shorthorns are bred by Messrs. Root, and Moseley, of Westfield, Wilson, of Agawam, Harvey Smith and Son, of West Springfield, and P. Stedman and Son, of Chicopee.

Herefords were formerly introduced into the western part of the county, from an importation by the Massachusetts Society. Some of the grades are still kept in Montgomery and other towns in that vicinity. A. N. Merrick, of Brimfield, has some animals of pure blood.

P. STEDMAN.

FRANKLIN.

The variety of soil in Franklin County is considerable, but it may be divided, definitely enough for present purposes, into two kinds, the alluvial soils in the Valleys of the Connecticut and Deerfield Rivers, warm, fertile and easily worked, and the stony soils of the hills, which make up, substantially, the rest of the county, for the most part cold, and only moderately productive.

As would naturally be expected, there is a marked difference in the products of the two sections. The hill towns produce very little grain, their principal reliance being upon stock and and its products,—butter, cheese, wool, &c.

In many of the hill towns population is diminishing. Many houses are unoccupied, and going to decay, and there is a general lack of thrift and enterprise among the farmers. Young men of energy and capacity seek more inviting fields, and those who remain, for the most part adopt the same plan of husbandry that their fathers pursued before them. This is particularly true of some of the towns east of the Connecticut River, where granite predominates, and the soil is colder and less productive than that on the limestone rocks, west of the river. The main feature in these towns is expressively termed "skinning," cutting off wood and timber, selling hay, and sometimes what little grain they raise, to the river farmers, "running" their mowing lands and then turning them into pasturage. In short, taking all they can from the land and returning nothing.

The stock in these towns is generally small and poor. In *some* of the hill towns, much attention is paid to the breeding of neat stock, and in Shelburne particularly, great success has been attained; and where we find good stock, we generally find good, thorough, systematic farming. Having lately visited some of the farms in Shelburne, I am able to state more particularly their style of husbandry, though, probably, most of the good stock farms in the county are conducted in substantially the the same manner.

These farmers raise very little grain, finding it cheaper to buy corn at the West, than to raise it on their stony soils. Most of them keep a few store sheep, and from them raise lambs for the market, and many buy sheep in the fall to fatten and send to market in winter or early spring. Their principal attention, however, is given to neat stock, which is almost exclusively Shorthorn and grade Shorthorn, and indeed, throughout the county, this stock so strongly predominates that other varieties need not be taken into account in speaking of the stock of the county.

The number of thoroughbred animals is not large. In Shelburne, George E. Taylor has fifteen; his brother, John Taylor, thirteen. There are two pure-bred bulls, one owned by the

Wilcox brothers, the other by R. and J. Anderson—the "Lord Mayor of Oxford," lately purchased of Samuel Thorn, of Thorndale, N. Y., a fine handler and a beautiful animal.

The rest of the stock in this town is grade, and the owners claim that it is superior to the pure-blood. Certainly there are grade herds that compare well with the thoroughbreds, and it is generally conceded that the Anderson stock is unequalled. This herd of R. and J. Anderson is the result of thirty years' persevering and intelligent effort to secure the highest quality of stock. At the time of my visit it consisted of forty head. At the head of this family stands their famous bull, "Roan Duke," which they consider the best bull in the world. They have owned him five years, and the younger portion of their herd is strongly marked with his characteristics, and it may well be doubted whether this collection of young stock can be surpassed, if, indeed, it can be equalled. They are not only remarkable for beauty and size, but their owners claim that they are equally superior in respect to vigor and hardiness; that they are much better feeders, and thrive on coarser feed than native stock. They do not, however, believe in starving young stock, but give them an abundance of good hay, without grain, feeding the coarse fodder to older stock.

Two heifers in this herd deserve particular mention. They will be four years old the coming spring, and are now being fattened for the butcher. Their present weight is about four thousand pounds, and they are as remarkable for comeliness as for size.

The Andersons cut a very fine quality of hay on their farm, getting four tons per acre from their best lands, mowing twice. They keep all their manure over one year, and then, without composting, spread it on their mowing lands in the fall.

James S. Grinnell, Esq., of Greenfield, to whom the farmers of Franklin County are indebted for much of their reputation as raisers of good neat stock and sheep, is the owner of a herd of eight thoroughbred Shorthorns. Several individuals in Deerfield have taken considerable interest in stock-raising. Josiah Fogg, Esq., has a herd of fifteen fine animals—pure-blood. Other individuals and other towns have taken a high stand in stock-breeding, and have gained a reputation thereby. There is a herd of pure-bred Jerseys, eight in number, owned by T. M. Stoughton, Esq., of Gill.

In those towns situated on the river, viz., Northfield, Gill, Montague, Sunderland, Whately, Deerfield and Greenfield, there has been considerable change in the course of husbandry within a few years, effected more particularly by the introduction of the tobacco crop. Less corn and broom-corn is raised than formerly, and though the hay crop has been increased, a large quantity is brought in from the neighboring hill towns, and some even from the West. Much grain, also, is brought from the West. The high price which tobacco has commanded, has made manure—without a liberal supply of which the crop cannot be raised—a matter of much importance and interest to the farmers, and they have purchased and fed hay and grain freely for the sake of the manure, as well as the profit on the stock fattened. Thus the farms have been enriched, a higher state of cultivation attained, and the general tone of farming raised; while the profits of the crop, for the last five years, have freed many farms from debt, and introduced a somewhat more liberal style of living among the farmers.

The mode of cultivation of the crop is similar in all the towns, and it is becoming more common not to continue the crop on the same ground more than one or two years in succession, and then heavy crops of hay, corn and wheat follow. The crop requires close attention, though for a short time only, the growth being very rapid. The plants are transplanted about the first of June, and the crop ready to harvest the last of August or the first of September.

In the town of Sunderland the cultivation of onions has been introduced, and the crop is becoming an important one. The crop in the town is estimated at not less than 25,000 bushels each of the last two years, the population of the town being 850. One gentleman had a piece of one and three-quarter acres last year, which yielded at the rate of 1,013 bushels to the acre. The profits of the crop have fluctuated widely, but it has never failed to bring a fair return; and the thorough cultivation and liberal supply of manure required, have had a good effect upon farms and farmers.

The requirements of both these crops, tobacco and onions, have led to the use of large quantities of foreign manures, principally Peruvian and fish guano, superphosphate of lime and plaster of Paris, with good success. The experience of most farmers, however, has led them to the conclusion that these manures, though valuable, cannot be substituted for the products of the barnyard—that they should be classed as stimulants, not as fertilizers.

Sheep-husbandry has received increased attention. Flocks have been introduced where they have not been seen for many years. They are being bred and kept with profit both for wool and mutton. Of the different breeds, the Southdown and grade Southdown predominate, and the raising of lambs for market produces the largest income. There are also some fine flocks of Merino sheep.

Some attention is paid to the culture of grapes, both by hot-house and open vineyard culture. There has been a small plot of land, of perhaps one-half acre, planted by the Messrs. Clapp, of South Deerfield. The land consists of a very light, sandy soil, with a southern aspect. The vines, through the past season of drought, looked fresh and vigorous. They have not commenced bearing yet. Several gentlemen in Sunderland have entered into the cultivation of grapes upon a small scale. The amount of product for sale the past year was from 50 to 300 pounds each.

In these towns spoken of as "river towns," there is nothing of that deterioration and decay which was mentioned as characterizing some of the hill towns. On the contrary, farms are increasing in value, the character of the buildings is improved, the old being repaired or new ones substituted for them, and farming is conducted in a more thorough, intelligent and systematic manner than formerly.

Modern farm machinery has been of great service to the farmer. The mower, hay-tedder and horse-fork have almost revolutionized the process of hay-making, and brought important aid to the farmer when it is most needed, enabling him to make hay when the sun shines. J. M. Smith.

BERKSHIRE.

The agriculture of Southern Berkshire is perhaps as varied and general as can be found in any other portion of like extent in the Commonwealth, having soils in great variety, possessing elements and properties that, with skilful culture, are suited not only to the growth of the principal grain and root crops, but to the successful culture of many other articles that have a commercial value, such as tobacco, hops, teasles, chiccory, &c.

The grass or hay crop is the great staple, and makes greater demands upon the skill and energies of the farmers in preparing their grounds, by a thorough process of draining, and fertilizing of their lands, the kinds and quality of seed used in stocking their grounds, and in clearing their fields of all obstacles and hindrances to the successful operation of the mowing machine, which, with other labor-saving machines, is becoming indispensable in securing this valuable crop. The lands more especially adapted to the hay crop, and where it is produced at the least cost, are the alluvial or bottom lands bordering upon the Housatonic River and its tributaries, and are found in the towns of Lee, Stockbridge, Great Barrington, Sheffield and Egremont, in which towns probably a larger amount of hay is annually secured than in any other towns of Southern Berkshire; while other towns, New Marlborough, Sandisfield, Alford, West Stockbridge, Tyringham and Monterey, produce no inconsiderable amount of this valuable crop; yet, from the new, broken, hilly and uneven condition of these towns, they are better suited to grazing, stock-raising and dairy purposes, for which they are admirably adapted. And it may not be out of place here to say that in the last-named towns there are annually produced as good butter and cheese, manufactured with as much skill and taste, as can be found anywhere in this Commonwealth. The exhibitions of dairy products at the annual fairs give ample proof, we think, upon this point. However much may be attributable to the climate, the pure air sweeping over these elevated fields, and the never-failing springs gushing out of their slopes and hillsides, act their part with other congenial agencies and influences in producing a luxuriant growth of white clover and June grasses, that give to these towns a prominent place in this essential and necessary part of agriculture.

The corn and other grain crops find a soil more congenial to their growth in the warmer, alluvial lands and slopes that are found in the towns of Sheffield, Great Barrington, Egremont, Stockbridge and Lee, in which towns there are annually raised, perhaps, more wheat, rye, corn and oats, and to greater perfection of quality and ripeness, and at less cost of labor and expense than in any other of the towns named, while in all the towns a good degree of interest is manifested by a high state of cultivation of the field crops, especially the corn, that being chiefly relied upon by the farmers in preparing their stock for the market. Increased attention has been given to the cultivation of the potato, in a variety of choice kinds; also to the raising of carrots, beets and turnips, they being considered indispensable, not only to cows in milk, but to sheep and growing stock.

The attention of farmers has been given to the importance of reclaiming (what heretofore has been considered worthless,) waste lands, generally the low, swampy or marsh lands, which are found in larger or smaller quantities in most, if not all, of the towns named. These marsh swamps are composed of vegetable substances, that have for ages been accumulating, and are found in the valleys and at the bases of hills and mountains, which, by a process of deep draining, and clearing and burning of the surface, are found to be amongst the most productive and valuable lands we have. Much of this land is annually reclaimed and brought into cultivation, and is adding to the cultivated lands in this part of the county.

The cultivation of tobacco and hops, for the past few years, has been steadily increasing. The towns of Sheffield, Stockbridge and Tyringham furnish lands well suited to growing tobacco. Among the most successful cultivators of this crop known to me, are Mr. Daniel Clark, of Tyringham, and John B. Hull, of Stockbridge. Mr. Clark informs me that, in 1864, he raised and sold, from one-half acre, of dry, merchantable tobacco, 1,680 pounds, or at the rate of 3,360 pounds to the acre. The tobacco sold in bulk, with other and inferior tobacco, for thirty cents per pound, giving a product of $504 for the half acre. Mr. Hull's yield of tobacco is but little inferior to this. Hops are raised with good success in Stockbridge, Egremont, and Alford, and selling at prices now that stimulate the cultivator of this crop.

A general increased attention is given by the farmers to improving their farms by more thorough and frequent draining, clearing up of hedges and waste lands, well built and durable fences, improved and well arranged farm buildings, and above all, an increasing desire for intelligence in all that pertains to agriculture.

The following table, compiled by the secretary of the Commonwealth, from returns made by the assessors of the different towns, May 1st, 1864, may not be without interest in showing the value of real estate, the number of horses, cows and sheep in the several towns in Southern Berkshire:—

TOWNS.	Real Estate.	Horses.	Cows.	Sheep.
Egremont,	$332,700 00	267	432	1,422
Great Barrington,	1,376,500 00	597	842	3,873
Lee,	925,915 00	325	708	802
Montague,	233,535 00	143	657	1,259
New Marlborough,	410,417 00	348	1,289	651
Otis,	182,150 00	155	534	640
Sandisfield,	429,900 00	259	1,274	416
Sheffield,	859,400 00	543	1,287	2,178
Stockbridge,	710,420 00	258	540	2,343
Tyringham,	213,600 00	79	400	662
West Stockbridge,	459,974 00	240	323	3,133
Alford,	201,998 00	118	191	1,893
Mount Washington,	71,666 00	53	149	84

Of the thoroughbred stock bred and kept in Southern Berkshire, I have been unable to obtain an accurate account, and can give only such information as I could get with the time and means at my command. Of the pedigree of the animals, and sources from which they were obtained, I have failed of gaining any knowledge. William T. Wilcox, of Sheffield, has two bulls and two cows of improved Shorthorns. Henry Burtch, also of Sheffield, has one Shorthorn bull and three heifers. George Higginson and John Winthrop, of Stockbridge, have each Shorthorn bulls and cows. Charles Spurr, of Sheffield, has two Hereford cows. Charles Hudson, also of Sheffield, has one Jersey bull. William Stanley, of Great Barrington, has one Jersey bull and five Jersey cows and heifers; also one Ayrshire bull and two cows and heifers; also two Chester County boars and sows. Jonathan E. Field, of Stockbridge, has one Jersey bull and cows; also Chester County boar and sows. George Kellogg, of Sheffield, has a Chester County boar. Frank K. Hinckley, of Lee, has a Shorthorn bull. Alonzo Bradley, also of Lee, has a Shorthorn bull and cows. T. D. Thatcher, of Lee, has Shorthorn cows and steers, and a fine herd of high-bred grade Shorthorns. Theron L. Foot, also of Lee, has Ayrshire bull, cows and heifers. General William Williams has an improved herd of Shorthorns and Ayrshires, and has done much in introducing thoroughbred stock in the vicinity in which he lives. Henry Burtch, of Sheffield, has a Chester County boar and sows. James Denell, of West Stockbridge, has a Byfield boar and sows. Joseph Wilcox, of Sheffield, has a Southdown buck and thirty ewes. William S. Wilcox, also of Sheffield, has two Southdown bucks and twenty-three ewes. Henry Burtch, of Sheffield, has thirteen Southdown ewes. The farmers of Southern Berkshire are greatly indebted to the Messrs. Wilcox and Burtch for the interest which they have taken in procuring thoroughbred animals, and in disseminating their qualities through the herds so generally in this section of the country. A. H. Joiner, James H. Rowley and J. A. Kline, of Egremont, have each fine flocks of thoroughbred Spanish Merino sheep. H. J. Carter, of Stockbridge, has pure Cotswold sheep.

In the town of Lee there is an extensive apiary, owned and managed by Mr. Alonzo Bradley. His apiary consists of about one hundred and twenty colonies. He uses the Langstroth hive. The scene of operations is in a young orchard, containing an acre or two of young apple trees, and a hive is set under each tree for the purpose of securing a partial protection from the intense heat of the sun.

As a protector in handling, Mr. Bradley recommends one made of common black coarse bobbinet lace which draws down over the face and neck. Two yards long and three-fourths of a yard wide are sufficient to make one, the piece being cut in two, and the edges of the two halves or pieces being sewn together in the form of a common grain bag without a bottom. A piece of small twine, a yard in length, is then run into one end of this bag-shaped protector, so that it draws up together like a lady's work-bag. The crown and rim of the hat will keep the meshes of this lace protector from coming in contact with the face and neck, while the string will close the lower end around the chest, thus making it impossible for a bee to insert a bill. The whole, labor and all, will cost about fifty cents. This is lighter, more convenient to carry, and equally effective with the gauze wire protectors which many recommend. A common pair of leather gloves would complete the armament, though Mr. Bradley handles them "without gloves."

In going about to examine into the condition of his hives, Mr. Bradley uses a dry piece of rotten hard wood, such as is usually called punk. Punk burns slowly and readily, without a blaze, but with smoke enough to fumigate a ship. With this little piece in hand, he blows a little smoke into the hive through the entrance. This should always be done in warm weather before raising the top of the hive to look under, or to examine for moths. It has the effect to frighten the inmates, or at any rate, to astonish them so much as to throw them off their guard, so that he can handle or do anything with them with perfect safety, by being gentle and careful. This mode of smoking is always used also in removing the honey boxes, or surplus honey from the top of the hives,—the "supers" as they call them. Raise the supers just enough to blow the smoke under, when these boxes may be removed without in the least enraging the busy bees. On all occasions, in fact, says Mr. Bradley, in your operations with your bees, use this smoke. It is perfectly harmless. A single good smart "blowing" upon the lighted punk is quite sufficient to prevent all nervousness on the part of the insects, and it is astonishing to see with what perfect freedom the bees could be handled, and with what affectionate docility they climbed and crawled in great numbers over the master's hands.

Mr. Bradley considers the Italian bees superior to our common black bees in several particulars. He has kept them four years, and now has thirty or forty swarms.

In the first place, he says, they are more industrious. As showing and proving this beyond question, he states that in the spring of 1863, he carried nine swarms of common bees, all strong and healthy, and one small swarm of Italian bees, about twelve miles from his own apiary. It proved a very unfavorable honey season in that location during the whole summer. The result was, that the nine swarms of common bees made seven "supers" of honey, and cast only seven young swarms. The swarm of

Italians made one "super" of honey, and cast one swarm, which filled its hive, and one super, and also cast a swarm. All of these swarms of Italians wintered well without feeding, while three or four of the common swarms required to be fed to get them through the winter.

In the spring of 1864 he carried two swarms of Italians about three miles from his home apiary, and made them into non-swarming hives. From the two swarms of common bees he took one hundred and six pounds of surplus honey, while from the two swarms of Italians he took two hundred and three pounds of surplus honey.

In the second place, the *pure* Italians are less inclined to sting, so much less, that they can be handled almost with impunity, without fear of their sting. The reason why so many bee-keepers are prejudiced against the Italian bees, on account, as they say, of their being so irritable, so cross, as they express it, is that they have got "hybrids" or half-blood queens, which have been sent to them, perhaps, for *pure* Italians, and they do not answer the recommendation. They consequently discard them without a fair trial. The progeny of these half-blood queens are more irritable than the common bee, although, in most other respects, they have the characteristics of the pure Italians.

In the third place, they are more prolific, and swarm earlier and more frequently. They are stronger, more courageous, and active in self-defence against other bees, and are seldom robbed, while on the other hand, they are not inclined to rob other swarms.

These reasons, or points of superiority, seem to be sufficient to establish a case without further argument, and I am ready to yield and say give me the Italians.

Mr. Bradley has a winter apiary, which is a dark shed, lined on the inside with straw, to which he removes his swarms when cold weather sets in, and where they are kept till spring. He showed us his mode of raising queens, and his manner of sending them off to any distance. To introduce an Italian queen to a common hive, he first removes its queen, then puts the Italian queen into the hive, in a little cage consisting of a bit of shingle with a gauze wire tacked upon it, so as to make an oval inclosure two or three times as big as the thumb, perhaps. Into this little cage the bees cannot enter, but they can run over it till they get acquainted with their new mistress, which will be twenty-four hours or so, when she is let out into the hive. If their own queen is destroyed before they are aware of it, and another, a stranger, is let in among them, they immediately pitch in, and perhaps kill her, but having lost their own queen, they soon get reconciled to a foreigner, and are glad to welcome her in the want of another.

In regard to raising Italian queens, he has kindly furnished the following statement:—

"It is not advisable to commence raising Italian queens in this section before quite the last of May, or first part of June, at a time when the hives are sufficiently populous to enable you to remove bees and honey without any great detriment to the parent stock. I make my queen-raising boxes six inches long, (inside dimensions,) five and one-half inches deep, five inches wide, with a front entrance in one end for the bees to pass and repass. This size of box will allow just three frames, four by five inches, on the Langstroth principle. All being ready, lift out a central comb from your Italian swarm, and with a sharp knife, cut out a piece of worker comb filled with uncapped brood and honey, just the size of one of your little frames, into which press it firmly; now take another little frame and fill it in the same way, with honey and *drone* brood; the third frame may be filled with empty comb, either from the parent stock or from surplus comb which you may have on hand; lift the combs carefully into the miniature hive; now take about one pint of bees from the parent stock, and put in with the combs and brood; give them sufficient ventilation and set in a dark, cool cellar. Let it remain there until near the evening of the second day, then place it some distance from your home apiary, where you wish to establish your queen-raising apiary. Or if you wish to raise your queens in your home apiary, it will be necessary to bring your bees for the purpose of raising queens, from a distance, say one and one-half miles, from a swarm you may have carried there in the spring for this purpose. On or near the evening of the second day, when you bring your bees from the cellar, let them take wing, as they now have their queen cells all started; they will soon return again, and readily accept this as their future home. In about fourteen days the young queen emerges from its cell, of a beautiful golden color, and in about seven days more she will become impregnated, if the weather is favorable, and commence filling the empty combs with eggs. Now remove and confine her in a queen cage. In removing, seize her gently by the wings with the thumb and fore-finger. Great care should be used not to squeeze or injure her. She is now ready to be introduced to a full swarm, and the queen-raising hive is ready for raising another queen.

"You should have your queen-raising apiary at least one and one-half miles from all black or common bees, and have Italian drones in abundance, or you will be troubled to keep the queens pure. If your object is to raise them to their greatest perfection, remove the Italian queen from the parent stock at a time when the bees are storing honey in abundance, and give her to some other swarm, previously prepared to receive her. This parent stock, now queenless, will start from five to twenty queen cells. When these cells are nine or ten days old, with a sharp knife, cut them out, leaving a piece of comb one inch square with each cell to which it is attached. Great care should be used in handling these cells, as a sudden jar or bruise is apt to injure or destroy the young queen in the cell. Give these queen cells to your miniature hives, one cell to each hive. It is supposed that you have your hives all prepared to receive these cells, by removing all uncapped brood several hours before you introduce your capped queen cell. Introduce the cell by cutting a piece of comb from one of your little frames, making a place just large enough to receive the cell, with the small piece of comb to which the cell is attached. The bees will accept it as theirs.

"After removing all these queen cells from the parent stock, or hive No. 1, give it the Italian queen, confined in a cage, the same queen you removed nine or ten days previous to this; now the hive which you remove the queen from, or hive No. 2, will at once start from five to twenty queen cells, in the same way as hive number one, or the parent hive, when you first removed the queen from that. In using these two hives in this way, by changing the queen from one hive to the other, in nine or ten days you will get an abundance of queen cells and a better class of queens than in any other way. Care should be used in changing this queen. After removing all the queen cells from one hive, give it the old queen, confined in a cage. Place her between two combs in the hive; let her remain for twenty-four hours; then daub her with honey and let her in with the bees. They will readily accept her.

"The question is often asked, What do you do with the bees in the queen-raising hives in the fall, when you get through raising queens? I take a common-sized hive, and put into it two or three combs, with honey sufficient for the bees for at least four weeks. I prefer a cold day. Now I take the bees from the queen-raising hives, and brush them with a wing from their combs into this common-sized hive. As the weather is cold, and they have no queens, they will mix without quarreling. Later in the fall, when it is freezing cold through the day, I take not only these bees, but all bees which I may have saved for this purpose, when I "take up swarms" and put them into my stock hives which I intend to winter. Previous to this, I have examined all my stock hives, and know just which ones need these surplus bees.

"I introduce them in this way. I commence first with the hive that is most convenient, and lift off the honey board; now, with my hand or a small tin dipper, I put one quart, more or less, according to circumstances, of these surplus bees on the top of the frames, directly over the cluster of bees in the stock hive, or hive No. 1. I now put on the honey board, shut the hive, and proceed in the same way with stock hives Nos. 2, 3 4, &c., until your surplus bees are all used up. The weather is such that the bees are too cold and stupid to fight, but will all mingle together as one swarm. By this practice you not only save all your surplus bees, but it is often found that some of your stock hives which have plenty of honey, have not sufficient bees to maintain the necessary heat in the hive for successful wintering; consequently they would die only as you add to them from these surplus bees. By adding these bees they come out in the spring a strong, healthy swarm.

"It is not advisable to attempt wintering swarms, that you do not know to be strong, free from all disease, and that have plenty of honey. It is from such swarms that we get our profits, and they require the least care, and will winter under most any circumstances—even in the open air, without extra protection. So will a strong, healthy cow winter by a haystack with nothing more for a protection; but would it not be best, after all, for the hay and cow both to be in a warm barn? So in regard to bees. They will winter enough better in a room or house prepared for the purpose to pay all extra expense and trouble, and ten times more.

"In the spring, examine all stocks to know their exact condition. If any are queenless, supply them with a queen from some weak swarm. Now give this weak swarm to some other weak swarm, which you may have in your apiary, that has a queen. If any are short of honey, give them some from some heavy swarm that may have it to spare. At the time you are examining your swarms, cut out all empty drone comb that is in the breeding part of the hive, and supply its place with empty worker comb by cutting this worker comb in just the shape of the drone comb that you have removed; now press it carefully into the place where this drone comb was cut from. This worker comb is from your refuse comb, which you have saved when you "take up swarms," and where your bees have died in wintering, &c. The object of this is to prevent the bees from raising such quantities of useless drones, which consume a great amount of honey, and to have them instead raise working bees, making a difference of several pounds of surplus honey in the coming season. The secret of success in apiculture consists in minding all these *little* things, and keeping your stocks strong."

The manufacturing towns of Lee, Stockbridge and Great Barrington furnish a convenient and ready market for a large part of the marketable produce of this part of the county, and at prices that can well stimulate the farmers in raising anything that enters into household consumption; besides, ready access is had by daily railroad communication with the cities of New York and Boston, and the beef and sheep of this valley are sought for of the feeders of stock here, by the market-men of those cities, of which no inconsiderable amount is annually furnished. H. GARFIELD.

LEE, February 1st, 1866.

At the same meeting it was unanimously

Resolved, That in the opinion of the Massachusetts State Board of Agriculture, the Department of Agriculture at Washington, if properly controlled, is capable of great service in developing the agriculture of the United States, on which the material prosperity of the country so largely depends.

Resolved, That the President of the United States be respectfully and earnestly requested to appoint some one to the responsible position of Commissioner of Agriculture, who, from his practical and scientific attainments, sound judgment and discretion, may commend himself to the respect and confidence of the intelligent farmers of the country, and wisely promote the agricultural interests of the United States.

Resolved, That the Secretary of this Board be requested to transmit a copy of these Resolutions to the President of the United States, and to the Secretary of the Interior.

NEW MEMBERS.

On Wednesday, February 7th, the credentials of new members, and those that had been re-elected, were presented, and reported upon by the chairman of the Committee, Mr. Garfield, to whom they had been referred. The following members were duly elected, viz.:—

Dr. George B. Loring, by the Essex Society.
John Johnson, Jr., by the Middlesex South.
Thomas W. Ward, by the Worcester.
Courtland Sanderson, by the Worcester West.
Thomas Billings, by the Worcester North.
M. F. Watkins, by the Highland.
Avery P. Slade, by the Bristol.
Charles G. Davis, by the Plymouth.
James Thompson, by the Nantucket.
E. W. Bull, appointed by the Executive.

ASSIGNMENT OF DELEGATES.

Delegates to attend the agricultural exhibitions of the county societies were assigned as follows: To the

Essex,	J. Johnson, Jr., of Framingham.
Middlesex,	Velorous Taft, of Upton.
Middlesex North,	S. Johnson, of North Adams.
Middlesex South,	Asa Clement, of Dracut.
Worcester,	James Thompson, of Nantucket.
Worcester West,	Thomas Billings, of Lunenburg.
Worcester North,	M. F. Watkins, of Hinsdale.
Worcester South,	C. G. Davis, of Plymouth.
Worcester South-East,	C. C. Sewall, of Medfield.

Hampshire, Franklin and Hampden,	A. P. Slade, of Somerset.
Hampshire,	T. W. Ward, of Shrewsbury.
Highland,	L. Agassiz, of Cambridge.
Hampden,	E W. Bull, of Concord.
Hampden East,	C. Sanderson, of Phillipston.
Franklin,	N. S. Hubbard, of Brimfield.
Berkshire,	L. Saltonstall, of Newton.
Housatonic,	L. Stockbridge, of Hadley.
Hoosac Valley,	J. M. Smith, of Sunderland.
Norfolk,	P. A. Chadbourne, of Williamstown.
Bristol,	George B. Loring, of Salem.
Plymouth,	A. Homer, of Brimfield.
Barnstable,	T. G. Huntington, of Hadley.
Nantucket,	P. Stedman, of Chicopee.
Martha's Vineyard,	C. O. Perkins, of Becket.

COMMITTEES ON ESSAYS.

Subjects, and the committees to which they were assigned, were selected as follows:—

1. *Fecundation, Gestation and Parturition of Domestic Animals.*—Messrs. Agassiz, Loring and Saltonstall.

2. *The Grass Crop: its Culture and Comparative Profit.*—Messrs. Stedman, Sanderson and Homer.

3. *The Dairy.*—Messrs. Hubbard, S. Johnson and Billings.

4. *Adaptation of Crops to Soils.*—Messrs. Moore, Slade and Cleaveland.

5. *Noxious Weeds.*—Messrs. Huntington, Kenrick and Taft.

6. *Management of Pastures.*—Messrs. J. Johnson, Jr., Watkins and Perkins.

7. *Chiccory: its Value and Cultivation.*—Messrs. Chadbourne, Stockbridge and Ward.

8. *Soiling.*—Messrs. Loring, Stedman and Huntington.

9. *Poultry.*—Messrs. Sewall, Garfield and Davis.

10. *Effects of Forests upon Agriculture.*—Messrs. Thompson, Smith and Ward.

11. *Native Plants worthy of Cultivation.*—Messrs. Chadbourne, J. Johnson, Jr. and Sewall.

12. *Plants as an Indication of the Nature of the Soil.*—Messrs. Stockbridge, Cleaveland and Thompson.

13. *Fruit Culture and the Preservation of Fruit.*—Messrs. Bull, Clement, Moore, Thompson and Stedman.

14. *Transplanting of Forest and Fruit Trees.*—Messrs. Clement, S. Johnson and Kenrick.

15. *Production of New Varieties of Plants.*—Messrs. Bull, Chadbourne and Garfield.

16. *Agricultural Education.*—Messrs. Perkins, Homer and Watkins.

17. *Agricultural Fairs: their Management and Usefulness.*—Messrs. Smith, Hubbard and Billings.

18. *Preservation of Birds beneficial to Agriculture.*—Messrs. Saltonstall, Smith and Taft.

19. *Cranberries.*—Messrs. Kenrick, Davis and Thompson.

20. *Nature and Extent of the Disease among Swine.*—Messrs. Davis, Slade, Smith and Moore.

21. *Peat as an Article of Fuel: Modes of Preparation and Value to the Commonwealth.*—Messrs. Loring, Thompson and Perkins.

Voted, To hold the regular meeting for public discussion, lectures, &c., at Concord, commencing on Tuesday, December 11th, at 12 o'clock.

Mr. Bull presented the following Report on

THE GRAPE.

The season just passed has been somewhat peculiar in its effects upon the grape crop. Premature heats pushed the grape into a too early growth, which was, in many instances, blighted by subsequent storms, alternated with cold, so that the crop was reduced considerably, and the beauty of the fruit ultimately gathered for market much impaired. The debility thus induced, also paved the way for mildew, rust and other grape-like weaknesses, still further injuring its value, and, for the first time in many years, the expectation of a full crop was disappointed.

These adverse circumstances, however, were not without compensations; they uncovered to the cultivator faulty modes of culture, and, to some extent, the relative value of the various kinds under cultivation, and will thus lead to better methods of culture and a judicious selection of varieties for the vineyard.

The cultivation of the grape is rapidly assuming the importance of a commercial staple. A Western periodical, in an article enumerating some of the most prominent grape-growers of that section, says they each of them grow from 100,000 to

500,000 vines annually, and that the cultivation of the grape has become so extensive, and the demand for vines so large, that the nurserymen find their immense stock altogether insufficient to supply the market.

Your Committee assume, as an established fact, that the grape may be grown in field or vineyard culture in Massachusetts with profitable results, and are gratified that they are able to state, that the cultivation of the grape, even in this abnormal season, has yielded so large profits that many are planting new vineyards, many acres of them in Middlesex alone.

Notwithstanding the adverse circumstances of the early spring, the subsequent season was all that could be desired for the grape. Intense heats, absence of rains and fogs, and an unusually fine autumn, ripened the crop to a perfection rarely witnessed; and even grapes of delicate constitution, and those which generally ripen too late for our climate, grew up to their finest condition, so that an intelligent judgment could be arrived at as to their comparative quality and value.

True, the results were various, some kinds doing well in one locality and failing in another, while some which failed in one instance succeeded in another, upsetting all general rules in the case, unless, indeed, diverse soils and treatment of the vine uncovered, as in some instances they did, the reason of the difference. But these circumstances were of great value to the vine-grower, who was thus forced to observe the best modes of culture, and kinds of soil and aspect, and what grapes are most certain to succeed, and to give him a remunerating crop for his outlay. This leads your Committee to observe that in no country in the world is there any one grape which will produce grapes and wine, especially the latter, of equal quality, in various localities; though the vineyards may be divided only by a wall, or foot-paths even. Difference of soil, of aspect, moisture, protection, &c., will have so great effect upon the quality of the grape and its vinous product, that it can hardly be recognized as the same grape. Where this happens, other grapes often give better fruit and wine, being, from some mysterious cause, better adapted to the peculiar soil, &c., of the location. We need, therefore, many kinds of grapes, and your Committee hail with pleasure every new seedling which promises to increase the list of good grapes, and supply the need just indicated.

Your Committee believe the grape crop to be one of the surest and most reliable of all fruit crops, if hardy varieties are grown; and that the general belief that it requires peculiar skill to grow them successfully is not sustained by experience. On the contrary, instances within our knowledge prove that no fruit crop is more easily grown, or will bear more neglect, provided the essential elements of success—heat, shelter, warm and dry soil—are present. Trenching and manuring are unnecessary and often injurious; they are, however, advisable for slow-growing and feeble sorts of grape; but these sorts are only suited to the garden and the amateur, and the conditions before mentioned must be present to insure success.

Hardy varieties of grapes are those which will bear the vicissitudes of our climate, the rigors of our winters, without protection, under all ordinary circumstances. No grape can be considered hardy which requires protection, and no grape which requires protection can be profitably grown in field culture, on the large scale, that is to say, because it involves too much expense and labor at that season of the year when all our time is engrossed with the late harvests and preparation for winter.

Grapes—with the exception before named—should not be grown in too rich a soil. The experience of ages proves that poor soils, if warm and dry, are better for the grape than rich ones. The finest grapes of the "Coté d'or" grow on a soil consisting of decomposed granite. The famous Chateau Margaux has a gravelly soil, with only six and three-quarters per cent. of organic matter, with three and one-quarter per cent. of peroxide of iron, one and one-quarter per cent. of potash, and one and one-half of clay. Mr. Griffith, at the fruit-growers convention, in Western New York, says: "Few kinds of grapes will grow on a strong soil. A poor, dry soil is best for all grapes but the Delaware." His oldest vineyard has borne for fourteen successive years; the soil has had no manure for twenty-two years; he believes his vineyard will last twenty years more without manure; soil, gravel and loam; a light corn soil.

In regard to pruning, your Committee would recommend, as they have always done, the system called spur pruning, as the most certain to produce an early and good crop, and the least exhaustive of the strength of the vine. They still believe November to be the best month for pruning, unless the vine be tender and need protection; in that case they would recommend pruning in October, as soon as the leaf falls, that the wood may heal before the covering of the vine in November. Directions for planting, training and cropping will be found in the early sheets of this volume.

The theory of aggregate heat, as well as that of isothermal lines, is an uncertain guide. Wherever the grape will ripen within the period of the intense summer heats necessary to its perfect development, there you can grow grapes to perfection. This proposition of course implies an early grape for northern latitudes—one which will ripen before the early frosts of autumn have robbed the soil and atmosphere of the necessary heat; but we have already grapes which ripen in August, and which will ripen, therefore, wherever Indian corn will ripen—that is to say, in most parts of New England. Plant the grape in your sunniest nooks, your warmest exposures; it is a child of the sun and loves heat. If we should be asked what element was most necessary to success in grape-growing, we should say *heat*.

No crop is more *profitable* than the grape. It has yielded, in various parts of the country, $2,000 to the acre. Do you think this an extravagant crop? Reduce it by one-half, and the market price of the remainder by one-half, and you still have $500 per acre; and this on your light and poor soils, which will not give you a remunerating crop of grain, or even grass,—an important consideration; for whereas all other crops require manure, of which our farmers have too little at all times, this valuable and profitable crop does not require it.

The cost of establishing an acre of grapes, as we have shown in former reports, is less than $300 per acre, where everything is purchased. Under ordinary circumstances, the first crop, which may be gathered the third year, pays all expenses. The cost of culture is about thirty days' work per acre—say forty-five dollars. The second crop, in the fourth year after planting—about 7,000 pounds in round numbers—will yield an income of $700, at ten cents per pound, which is one-half the price for which the Concord grape sold at wholesale this year.

If you have any fears of glutting the market for the fruit—a fear which we do not entertain, you have the alternative of wine-making, or selling the fruit for that purpose. Let us see what would be the result of this method.

One bushel of Concord grapes yields four gallons of wine, pure juice, worth, at the press, at least the price paid in the West, viz., $\$1\frac{60}{100}$ per gallon, or ten and two-thirds cents per pound. This wine, when ripe, as it will be in three years after making, will sell for four dollars per gallon, or twenty-six and two-thirds cents per pound for the grapes, less interest and wine-making expenses. In any event, therefore, your crop is sure of market at remunerating prices.

The making of pure wine from our own grapes is a matter of national importance. Not only will it prevent the export of the precious metals to pay for the large importations of this beverage, but by superseding, as it will, the destruction of immense quantities of our breadstuffs now used for distillation into whiskey, and thus adding to our capacity for exporting the same, keep the balance of trade in our favor to the same extent as so much gold.

The wine product of the United States, estimated, in 1860, at 2,000,000 gallons, reached, in 1865, the largely increased figure of 10,000,000 gallons, worth, *at the press*, $\$1\frac{60}{100}$ per gallon, an aggregate of $16,000,000.

France, with a population but little in excess of ours, makes 884,000,000 gallons of wine, more than three-quarters of which is consumed by her own people. Yet, according to the testimony of innumerable witnesses, her people are temperate, frugal, industrious and thrifty, intemperance, out of the cities, being but little known. We can make at least as much wine as she can, and, at least one of her sons has said, that the quality of our wines will be unsurpassable. We append the tables of Haraszthy, compiled from authentic records, to show the magnitude of this interest in Europe.

Your Committee forbear to offer an opinion in regard to the new grapes which have recently been introduced to public notice. It is too soon for an intelligent opinion which would guide the public in selecting them for cultivation. Some of them are of excellent quality, but all of them need further trial in this State. They feel called upon, however, to notice the continued efforts of Mr. Rogers, of Salem, to still further improve, by hybridizing and raising new seedlings, the fine hybrid grapes which he has already given to the public; a work in which all Massachusetts men must take a deep interest, and which places Mr. Rogers in the rank of benefactors of the race.

The Average Wine Production of Europe reduced to American Acres and Gallons.

	Acres.	Gallons.	Gallons per acre.
Austria and her Provinces,	2,685,950	714,000,000	$265\frac{5}{6}$
Greece and the Grecian Islands,	41,781	8,160,000	$195\frac{3}{10}$
Ionian Islands, (for raisins,) over 42,000,000 pounds,	35,812	1,224,000	$34\frac{1}{6}$
Italy,	2,887,970	1,275,000,000	$441\frac{1}{2}$
Switzerland and Belgium,	76,400	2,550,000	$33\frac{3}{8}$
France,	5,013,774	884,000,000	$176\frac{2}{7}$
Spain,	995,004	144,500,000	$151\frac{7}{10}$
Portugal,	238,751	25,500,000	$106\frac{8}{10}$
Total,	11,935,442	3,054,934,000	$255\frac{95}{100}$

Germany.

	Acres.	Gallons.	Gallons per acre.
Saxony,	5,945	340,000	$57\frac{1}{6}$
Prussia,	53,719	7,225,000	$134\frac{1}{2}$
Bavaria,	125,344	20,400,000	$162\frac{3}{4}$
Wirtemberg,	65,656	10,200,000	$155\frac{1}{3}$
Baden,	65,656	7,140,000	$108\frac{3}{4}$
Hesse,	23,875	4,250,000	178
Nassau,	10,143	2,550,000	$237\frac{1}{3}$
Total,	350,338	52,105,000	$148\frac{78}{100}$

The aggregate number of acres under wine culture in Europe is 12,285,780.

The total average yield per year in Europe is 3,107,039,000 gallons.

The wines of Germany would bring, at 25 cents per gallon,	$13,026,250
And those of other countries, at 25 cents per gallon,	763,733,500
Together,	$776,759,750

In Germany the average income per acre would be thus, ... $37.18¾

And those of other countries, taken together, per acre, ... 63.98¾

But, taking each county or state separately, their wines would bring, upon the above average price of 25 cents per gallon, as follows:—

European Countries.

	Total Amount.	Per Acre.
Austria and her Provinces, ...	$178,500,000 00	$66 46
Greece and the Grecian Islands, . . .	2,040,000 00	48 82
Ionian Islands, ...	306,000 00	8 54
Italy, ...	318,750,000 00	110 37
Switzerland and Belgium, ...	637,500 00	8 34
France, ...	221,000,000 00	44 07
Spain, ...	36,125,000 00	37 92
Portugal, ...	6,375,000 00	26 70
Total, ...	$763,733,500 00	–

German States.

	Total Amount.	Per Acre.
Saxony, ...	$85,000 00	$17 79
Prussia, ...	1,806,250 00	33 62
Bavaria, ...	5,100,000 00	40 68
Wirtemberg, ...	2,550,000 00	38 83
Baden, ...	1,785,000 00	27 18
Hesse, ...	1,062,500 00	44 50
Nassau, ...	637,500 00	59 33
Total, ...	$13,026,250 00	

E. W. BULL.

Voted, That a committee of three be appointed by the chair to investigate the question of peat as an article of fuel, the best modes of preparation, and, if possible, its value to the Commonwealth, and report to the Board.

The committee was constituted by the appointment of Messrs. Loring, Thompson and Perkins.

On Thursday, the 8th, the matter under discussion was the disease among swine, and many important facts were stated by by Messrs. Moore, Slade, Davis, Taft and others.

It is believed that comparatively few are aware of the great losses that have occurred from the purchase of swine that have passed through the public markets. They not only die themselves from the infection caught in the cars or the pens into which they are turned on their arrival from the West, but they convey this infection to large numbers of others with which they are brought in contact, and death is the almost certain result.

The only way to avoid these frequent and serious losses seems to be to raise our own swine or to purchase those only that are raised in the neighborhood from stock known to be healthy. The farmer who has lost swine from this disease, popularly known as the "hog cholera," should also take the precaution not to put other hogs subsequently bought, into the pens occupied by those that have died. Such pens are infected, and it is with the utmost difficulty that this infection can be entirely removed. It was

Voted, That the State Board of Agriculture, in view of the losses incurred by the disease known as the "hog cholera," and of the information gathered from all parts of the State, of the great extent of these losses, and of its great contagiousness, not only from diseased hogs, but from pens in which they have been kept, *recommend* to the farmers of Massachusetts that they raise swine for their own use, and for the market.

Voted, That the raising of hogs for the market, is of itself, in our opinion, one of the most profitable sources of revenue to the farmer.

Voted, That a committee be appointed to investigate and report upon the nature and extent of the disease among swine—Messrs. Davis, Slade, Smith and Moore.

Voted, That each member of the Board be requested to gather what facts may be in his power in regard to the agriculture, including any individual modes of practice, statistics of blood stock, &c., which may be of public interest and importance within the limits of the society which he represents, and report the same to the Board at the next annual meeting.

Voted, That a committee of three be appointed by the chair to lay out the work and make arrangements for the meeting of the Board at Concord, December 11.

This committee was constituted by the appointment of Messrs. Loring, Bull, Huntington and the Secretary.

Voted, That the Committee on Meetings be authorized to complete any unfinished business.

Voted, That the next annual meeting be held at the office of the Secretary, commencing on Thursday, January 31, 1867.

Adjourned.

THE STATE CABINET.

The public interest in the State Cabinet continues unabated, and it is now recognized as one of the practical educational institutions of the State. The visitors throughout the year average from eighty to ninety per day, and an attendance of from one hundred to one hundred and fifty is by no means uncommon. It is often visited by scientific men from abroad for purposes of reference, and all express themselves pleased at the evident value of the union of practical and scientific groups that is here exhibited.

The donations through the past year have not been as extensive as in some others, but many specimens have been added that were new to the collection.

IN ORNITHOLOGY.

Henry A. Purdie presented a fine male specimen of the Golden-winged Warbler, *Helminhophaga chrysoptera*. (Baird.)

Edward A. Samuels donated a specimen of the Mourning Warbler, *Geothlypis philadelphia*, (Baird.) and a fine male Black-throated Blue Warbler, *Dendroica canadensis*, (Baird.) Also a male Quail, or Virginia Partridge, *Ortyx virginianus*.

Mr. **George M. Dexter**, of Brookline, donated a splendid pair male and female, of the Golden Pheasant, *Thaumalea picta*, (Linn,) of a flock that he has domesticated and acclimated in this State.

D. T. LETTENEY presented a female American Pelican, *Pelicanus fuscus*, and other individuals donated other specimens, not, however, new to the collection.

OOLOGY.

In this department the following additions have been made:—

Eggs of the Red-shouldered Hawk, *Buteo lineatus*, (Jardine,) donated by T. C. CHAMPION.

Egg of Sharp-shinned Hawk, *Accipiter fuscus*, (Bonap,) donated by H. B. UPHAM.

Nest and eggs of Nashville Warbler, *Helminthophaga ruficapilla*, (Baird.) donated by E. S. WHEELER.

Nest and eggs of American Goldfinch, *Chrysomitris tristis*, (Bon,) donated by WILLIAM POLSON.

E. A. SAMUELS donated the following specimens:—

Egg of the Cooper's Hawk, *Accipiter cooperii*, (Bonap.)
Eggs of the House Wren *Troglodytes aedon*, (Vieill.)
Eggs of the Black-capped Titmouse, *Parus atricapillus*, (Linn.)
Eggs of Sharp-tailed Finch, *Ammodromus caudacatus*, (Swain.)
Eggs of Sea-side Finch, *Ammodromus maritimus*, (Swain.)
Eggs of Blue Bird, *Sialia sialis*, (Baird.)
Eggs of Ruffed Grouse, *Bonasa umbellus*, (Stephens.)
Eggs of Red-headed Woodpecker, *Melanerpesverythrocephalus*, (Swain.)
Egg of Night Hawk, *Chordeiles popetue*, (Baird.)
Egg of Carolina or Turtle Dove, *Zenaidura carolinensis*.
Egg of Guinea Fowl, *Numida meleagris*, (Linn.)
Egg of Domestic Turkey, *Meleagris gallopavo*, (Linn.)
Egg of domesticated Canada Goose, *Bernicla Canadensis*, (Boie.)

ENTOMOLOGY.

In addition to the usual contributions of the Curator to this department, some five hundred specimens have been received from other sources.

By far the largest donation was contained in five glazed cases, consisting of 439 specimens, representing about 120 species,.prepared and presented by Mrs. H. W. WELLINGTON, of West Roxbury, Of these 288 are *Lepidoptera*, (Butterflies and Moths;) 40 *Coleoptera*, (Beetles;) 35 *Neuroptera*, (Dragon-flies, &c.;) 39 *Orthoptera*, (Locusts, Grasshoppers, &c.;) 25 *Diptera*, (Flies;) 9 *Hymenoptera*, (Wasps, Bees, &c.;) and 6 *Hemiptera*, (Bugs.) With this collection were presented 32

Arachnidæ, (Spiders,) and a specimen (dry,) of the brown snake, *Coluber ordinatus.*

Mr. Charles Cook, of Bolton, presented, through Mr. L. Wetherell, a cluster of the cocoons of a small hymenopterous insect, belonging to the genus *Bracon,* which is parasitic upon the tent-caterpillar of the apple, *Clisiocampa americana,* (Harris.) Also, a cocoon of a minute moth, belonging to the genus *Yponomeuta,* from which four parasitic hymenoptera were reared.

Mr. J. C. Merrill, of Cambridge, presented eggs of *Hybernia tiliaria* (Harris)—(the lime-tree winter moth;) *Ennomos magnaria,* (Guenée;) and *Anisopteryx vernata,* (Harris,)—(the canker-worm.) Also, specimens of *Capnia necydaloides,* (Pictet,) and *Dromius piceus* (Dejean.)

Mr. E. Burgess, of Boston, presented several moths belonging to the family *Noctuidæ,* and larvæ of *Dasylopha anguina,* (Smith,) obtained in Beverly.

Mrs. Hannah P. Mackintosh contributed a specimen of the root of the apple, showing the damage done by the larva of the common Dor-beetle, *Lachnosterna fusca Ill., Phyllophaga quercina,* (Knoch.)

Mr. Charles Breck, of Milton, presented a block of White Oak, *Quercus alba,* (Linn,) containing a colony of small black ants, *Formica pensylvanica,* and specimens of Black Oak, *Quercus tinctoria,* (Bartram,) attacked by borers of the Lepidopterous genus, *Xyleutes,* (Newman.)

Mr. William F. Poole, of the Boston Athenæum, contributed eggs of *Ennomos magnaria,* (Guenée,) attached to a twig of the apple.

The State Cabinet is designed to illustrate the extent and richness of the natural history of this State. It is not a miscellaneous collection from all parts of the world. It does not occupy the ground of other great collections, like that owned by the Boston Society of Natural History, or the superb collection of the Museum of Comparative Zoölogy, at Cambridge. It would be of little use to attempt to rival these grand collections in extent or variety, with the facilities at our command, and the space allotted to the Cabinet.

As a collection of our own natural history, it is both useful and instructive, and is becoming more and more so every day, with the constantly accumulating specimens. And this local character constitutes its chief interest and attraction.

Whenever it is removed from its present position, its character, as a State collection, should be considered, and a disposition made of it that will preserve this distinctive character so far as possible, so that there shall ever remain somewhere a collection of the natural history of this Commonwealth. The Agricultural College would seem to be the most fitting destination in this respect, and the claims of that institution should be duly considered when the decision to remove the Cabinet is made.

THE AGRICULTURAL LIBRARY.

The library connected with the office of the Secretary has gradually but constantly grown, till it has become the best, with very few, if any, exceptions, to be found in the country. It is of great service to the public, more especially during the sessions of the legislature, when it is largely used for consultation and reference.

THE CATTLE PLAGUE.

Allusion has been made, on a previous page, to the dreadful disease which is now raging throughout England and Scotland, baffling all the attempts of science and skill to check its devastating course. No efforts that can be made to prevent its gaining a foothold in this country would seem to be superfluous or uncalled for. No language can describe the suffering and misery which its spread here would entail upon us. The accounts of its progress abroad do not seem to be exaggerated. Since its advent in Great Britain it has gradually and steadily advanced both in territory and in fatality, till it is now, at the last accounts, destroying over twelve thousand head of cattle a week; while the most trustworthy advices admit that little more than half the actual cases are officially reported. If this is the case, the real losses foot up to nearly twenty thousand head a week.

We can, therefore, form some idea of what we may expect, if, through neglect to guard our widely extended coast, and delay to adopt the proper precautions, it is allowed to land and gain a foothold among our herds. And when it is considered that it may be brought in the hides of animals, vast numbers of which are annually imported, or in the clothes of those who come in contact with animals there, or in several species of smaller animals, like the sheep, the goat, the deer, we must see that the probabilities of an invasion are by no means small, notwithstanding the shortness of the period of incubation, which is in our favor in our efforts to protect ourselves from it.

So far there is no reason to suppose that the disease has ever been known upon this continent. The disease is peculiar and well defined. Its symptoms are well known. They have been carefully studied by the first scientific men in Europe. It is our duty to accept the results of their experience and observation, and to adopt the only means known to them to guard against it, and that is to extinguish it as soon as it appears among us, at whatever sacrifice. England could have spared herself the misery and ruinous loss which the last six months have witnessed, by a sufficiently prompt and efficient action. That is now admitted. France did actually root out the disease in the month of December, after it had been introduced into the garden of acclimatization at Paris, but only by the most decisive action on the part of the government and of individuals. We have examples of both lines of policy, and the results of both to guide our efforts in case of an outbreak upon our shores. No rational man can hesitate a moment what course to adopt in such an emergency.

We have, fortunately, what some other States have not, a cattle commission prepared to act. Let us sustain this commission, if the occasion offers, by the power of a united public sentiment, as the only means of protection and immunity.

This, it may be said, is a danger far off and little likely to affect us. Yet we should remember that it has seldom been wholly eradicated from a country that it has once invaded, and be on our guard against its nearer approach.

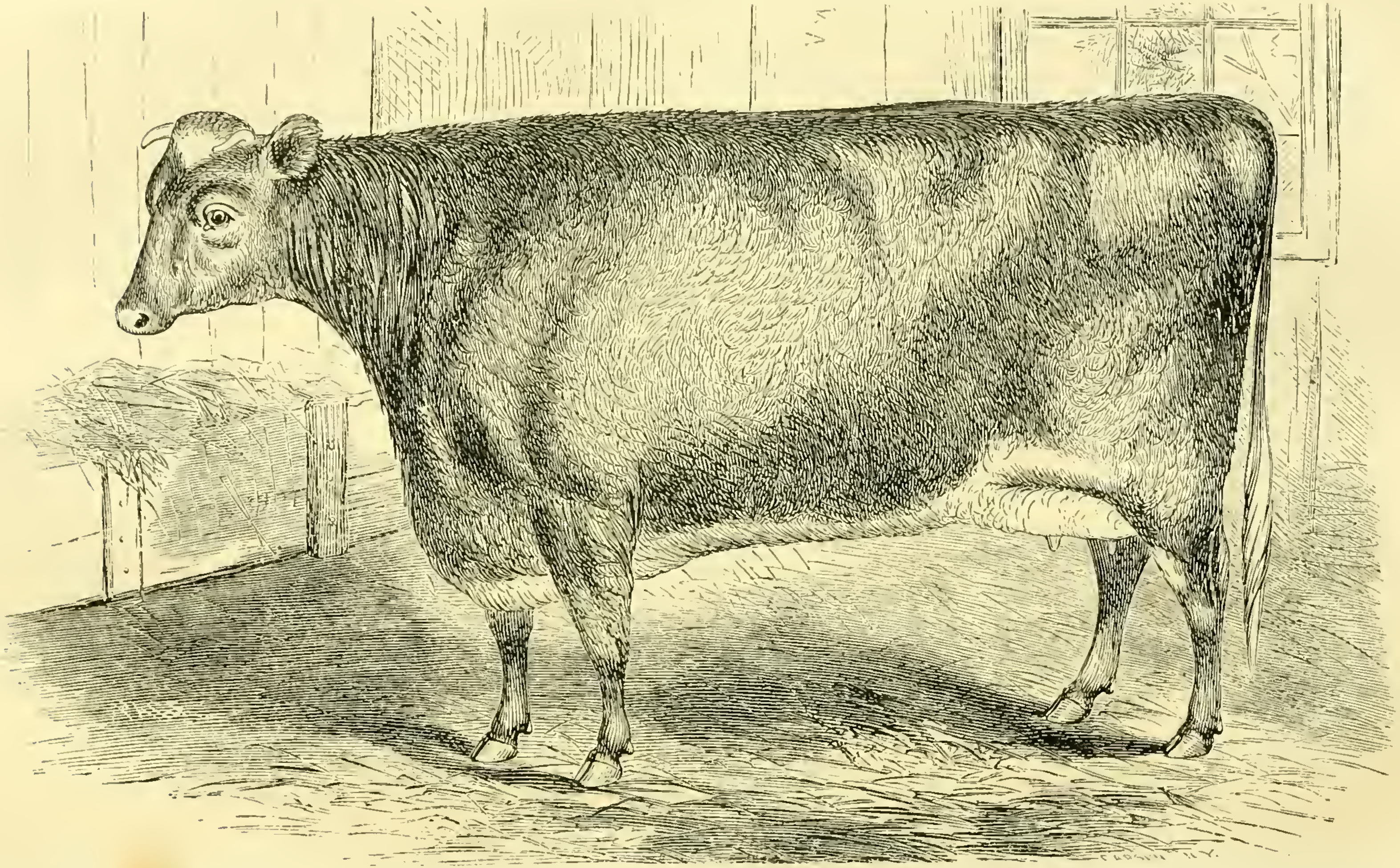
On the whole, the agriculture of the Commonwealth has been prosperous during the past year. Farm labor has been high, to be sure, but so has farm produce of every kind, and it is doubtful if there ever was a time when the farmer could command more for his labor or for the yield of his farm, than during the last few months.

The progress made in the establishment of an agricultural college has been as great, probably, as could have been expected under the circumstances. The enterprise is new and the details require much laborious thought and attention. The location of the buildings has been finally determined upon, and the work will doubtless be pushed forward with rapidity during the coming season.

It is desirable that every effort should be made to bring the highest intelligence to bear upon the development of our material resources. We have markets at our very doors for everything we can raise upon the farm, in the garden or the orchard. We have the soil and the facilities of transportation required to make farming productive. We should take every step that may be necessary to make the most of whatever advantages we possess, and this may be done by promoting the highest degree of intelligence among the young, who are to be the future possessors and tillers of the soil. In this way, and this alone, can we hope to rival the fertile fields of the West or the more genial regions of the South. And when the comparative advantages of different sections are weighed, may we not hope by the fostering care of the State, to present greater inducements to the sons of Massachusetts to remain upon the farms of their fathers, than any other location can offer?

CHARLES L. FLINT,
Secretary of the State Board of Agriculture.

Boston, January 31, 1866.



Shorthorn Cow—"LADY SALE 8TH." Recently purchased by CARLOS PIERCE, Esq., from the herd of H. G. White, South Framingham, Mass.

APPENDIX.

REPORTS OF DELEGATES

APPOINTED TO VISIT THE

AGRICULTURAL EXHIBITIONS.

ESSEX.

The cattle show and fair of the Essex County Society, at Lawrence, on the 26th and 27th days of September last, was a successful affair, and quite creditable to the parties interested. Both days were fine, and the extreme dryness at the time was the only serious drawback to any branch of the exhibition.

As was to be expected, the multitude of visitors was quite large both days, and all seemed much interested in the various departments of the show.

On visiting the cattle-pens, our attention was attracted in the following order: Ayrshire stock, by George B. Loring, Salem; bulls, steers and heifers, of various ages; appeared well. Also, 10 Merino sheep and 6 lambs, all true to their instincts, greasy and dirty-looking, but fleeces so fine that the fibre is scarcely discernible with the naked eye. Ben. Perley Poor, of West Newbury, 1 thoroughbred Shorthorn bull. J. S. How, Methuen, 1 pair fat cattle, one of which weighed 2,025 pounds, a fine pair of steers, a cross between Durham and Hereford, with a nice Durham calf, thirteen weeks old.

There was one grade, Devon and Native, calf, four months old, weight, 407 pounds, by J. G. Dwinnells. A good Durham cow, shown by A. C. Rollins, of Methuen, with her heifer, which is half Ayrshire. The mother was fourteen years of age, and in ninety-seven days gave 1,647 quarts of milk, which brought $101.82. The heifer, three years old, dropped her calf in June last; yield, twelve quarts of milk per day.

Daniel G. Todd, of Rowley; 1 pair prime, fat cattle.

Mrs. Charles Harriman, of Groveland, took the second prize for fat cattle.

William Peters, of North Andover; 1 pair working oxen, which would be hard to beat.

There were other working oxen, cows, heifers and calves, all of which had good points, some more and some less. The cattle were not very numerous, but of a quality which evinced taste and judgment on the part of the Essex County farmers.

The show of brood mares, family horses, farm and draft horses, and colts, in the aggregate was comparatively large; quality, good.

But few specimens of the swinish tribe were to be seen, but these were fine ones. Daniel Carleton, of North Andover, had a breeding sow with twelve pigs, which we should say were about half-blood Chester County; but what they were crossed with we did not learn. All good in their way.

Of the feathered tribe there were Muscovy ducks, Bremen geese, Guinea fowls, Brahmas, pigeons, &c.

At the ploughing-match, six double, three single, and five horse teams participated, and, under the circumstances, the performance was all that could be reasonably looked for.

At any time when the earth was wet the ground selected could have been nicely turned, for it was a good sward, teams in good order, ploughmen who understood their business; but so thoroughly had the moisture evaporated from the soil, that what was thrown up from below the turf rolled back like meal or dry ashes. Yet, notwithstanding this disadvantage, the furrows were well turned, and as deeply as is customary, which, in these latter days, is *no skinning* process, and never should be where it can be avoided.

The side-hill plough experienced the most difficulty in turning furrows, which was unavoidable, owing to the peculiar construction of the mould board.

A word in relation to ploughs may be *apropos*. There are several makers who get out good machines, all of which have their favorite adherents, and in point of workmanship, or of work performed, the real difference is perhaps very slight. It is evident to my mind, however, that the plough which holds the easiest while in operation, is, as a rule, of the lightest draft; for, when one will stand alone, turn a furrow well after being set in, it is the best evidence in the world that the pressure on both sides is about equal, which is as it should be. There is yet room for improvement in the construction of ploughs. Yet, when our mind reverts back to boyhood's days, when we used wooden mouldboards, with old saw-plates, old hoes, with narrow strips of old iron nailed on to prevent wearing, (though we think they did not much diminish the friction,) we are ready to admit that vast improvement has been achieved in that direction.

The farm implements on exhibition consisted of a New England cornsheller and a pump. This department seemed to lag far behind all others. I trust our agricultural tool and implement manufacturers will see to it that the like does not again soon occur.

Judkins & Goodwin, of West Amesbury, showed one good carriage, for which they received a premium of ten dollars. All there was in that line.

In the hall there was some excellent looking butter, good cheese, bread and honey. At the time I saw it, (nearly dinner-time,) my mouth watered, as the phrase is; but I did not apply my knife, and my belief is that no one but the committee did so, as it should ever be on like occasions.

In the fruit department there were many contributors. Apples and pears were brought in from all parts of the country, and made a grand show. The display of apples, as a whole, was the best we saw last autumn, with the exception of that made by Frederic Clapp, of Dorchester, at the annual exhibition of the Massachusetts Horticultural Society.

It was made apparent, also, that the people of Essex County—some of them, at least—like those in many other localities, have *grape on the brain.* Indeed, the development in that direction appeared quite prominent. E. Mitchell, of Haverhill, G. W. Gage, of Methuen, were so affected that the disease may be regarded as *chronic* with them. Well, go on, gentlemen. You are doing a good work for the people by increasing the varieties and improving the quality of our hardy native grapes. Try to get out some seedlings which shall beat the Concord, Diana, Deleware, and all others now in existence.

Peaches were not abundant, but large and fine.

There were rather more than the usual quantity of flowers, which were a great attraction for the ladies, and gentlemen, too, who had taste for the beautiful things in nature.

There was a good display of vegetables, with rather an inclination on the part of some to show large and coarse specimens instead of fine ones. Levi Emery, of Lawrence, a market-gardener, possessing skill and experience, bore away the first prize in this department.

Rugs and counterpanes of excellent quality were shown. Leather boots, also, which made an ordinary pair look old and mean. Fancy articles innumerable, and of almost endless variety.

Another feature of the show, and which, in my judgment, added much by way of gratification to all visitors, was the display made by the Washington Mills, occupying, as they did, the whole south wall in City Hall, and a table four feet wide, with the various patterns and fabrics manufactured by the company. The windows and wall were most tastefully draped, contrasting colors and intermixing in such a manner that the mind of the beholders would at once appreciate, to some extent, the gorgeous view.

The Everett Mills were represented by some excellent goods, of another kind and for other purposes, but much less extensively. This part of the exhibition was gratifying to us in two respects. First, the sight was truly magnificent; and, second, it gave us an idea—a faint one, perhaps—of the variety and quality of goods coming from Lawrence looms. And I can imagine no reason why manufacturers should not, when there is an opportunity, as there was in the instance cited, display their goods, and thereby lend their influence to create and foster a fraternal feeling between those engaged in the varied industrial interests of our glorious old Commonwealth.

In conclusion, let me say that beneficial results must necessarily grow out of the exhibition which I have so imperfectly described. Farmers and others, drawn together from all parts of the county, and some from other counties, to spend a day, or two days, in comparing notes, a spirit of generous emulation is revived; but *no* envyings or heart-burnings engendered, for there is too much room for other and better feelings to take possession of the mind and heart; too many noble objects to view; too many attractions inspiring in their nature to permit ignoble thoughts to come in for any share in this work. In a social point of view, the benefits arising from such gatherings are incalculable.

Farmers, as a class, are measurably isolated, and need to have this isolation broken occasionally, that they may come more frequently in contact with each other, and with society, in common with others. It rasps off the feather edges, smooths the rough corners, softens the asperities, and relieves the mind and muscles from the cares and labors of home duties for the time being, affording a short period of time for recuperation, which is as needful to farmers as to others.

Our acknowledgements are due, and cheerfully tendered, to Charles P. Preston, secretary of the society, Hon. Milton Bonney, mayor of Lawrence, and others, for courteous attentions during our visit as delegate of the Board. ASA CLEMENT.

MIDDLESEX.

Agreeably to instructions from the Board of Agriculture, I attended the annual fair of the Middlesex County Agricultural Society, held at Concord, September 21st.

My anticipations of pleasure were more than realized by all I saw and heard. The place itself is hallowed ground, treasuring, as it does, some of the first blood shed in the cause of liberty on the continent. And while the names of such men as Hawthorne, Thoreau and Emerson are held in remembrance, it will be regarded as the home of genius and letters, while a host of witnesses will testify to the hospitality, intelligence and refinement of the people who compose this lovely village.

Here, too, is the home of the Concord grape and its originator, whose enthusiasm in his chosen work knows neither intermission nor decay, and whose prophetic eye waits patiently for the day that shall witness the triumph of his skill, and attest the value of his labors in the production of a grape which, even in the rigors of a New England climate, and upon our rocky hillsides, will show a vintage not unfit to be compared with that of sunny France herself.

One of the most noticeable things in regard to the agriculture of Middlesex County, is the increase of her market-garden products, and the extension of this branch of industry to localities hitherto thought to be too remote from market for its profitable pursuit.

From fifty to seventy-five years ago Roxbury and the adjoining region was the garden of Boston. Crowded out of this by the increase of business and population, Cambridge and West Cambridge have successively become the centres of this interest, until now the goodly city, in her desire to spread herself, threatens to cover these lands also with suburban residences, and so push out the gardening business into the belt of towns beyond.

This county, from its size and proximity to markets, will probably for a long time take the lead of all others in the State in this important interest. A reference to the statistics of Massachusetts for 1860 will show that its importance is not likely to be overestimated. I find there that the products of the market-gardens of this county alone amounted to nearly eight hundred thousand dollars, which is nearly one-quarter more than what was produced by the rest of the State, greatly increased since. Somewhat surprised by this statement, I was induced to look at the other products of the county by way of comparison.

The county contains a little more than one-ninth of the improved land of the State. The cash value of her farms is about one-fifth. The value of farming implements is between one-third and one-fourth. She owns one-sixth of the horses, more than one-fifth of the cows, and nearly one-sixth of the swine. She raises more than her proportion of corn and oats; one-fourth of the pease and beans; one-sixth of the potatoes; one-eighth of the barley; one-third of the value of orchard products; one-sixth of the wine; more than one-seventh of the hay; more than one-third of the grass-seeds, not including clover; about one-third of the hops. In no articles of considerable value does she fall below her proportion, excepting those of sheep, wheat and buckwheat.

From the above, it appears that, with a surface of improved land equal to about one-ninth of the State, she furnishes, in the most important articles, from one-tenth to one-half, and even more, of the total products of the State. It is curious to note, also, that this result is brought about by small farms, Middlesex having instead of one-ninth, more than one-seventh of the farms in the State; in fact, about two-thirds of the farms in this county are in size under fifty acres. (Those of us who listened to Prof. Bascom's lecture, at Worcester, on the political economy of agriculture, will see here a very striking illustration of the principle laid down and illustrated by him so forcibly, viz., that while in manufactures diffusion of capital tends to an increase of profit, in agriculture that result is to be reached only by its concentration.)

The chief interest in this county lies in the dairy stock, in which there is invested about a million and a half of dollars; in the hay crop, the value of which is probably about the same; and the orchard and market-garden products, of which is raised more than a million dollars worth.

As might be expected, I found the chief attraction inside of the hall, in the show of fruits and vegetables, and outside in the several herds of cows on exhibition. Of the exhibition of fruits and vegetables it would be hard to speak in too high praise. Size does not seem to have been thought of so much as perfection of form and quality. This is as it should be, and where there was such uniform excellence it would be invidious to particularize. I would say, however, that if I might make a single exception, and were permitted to go outside of the fair grounds, it would be in favor of the worthy secretary of the society, whose vineyard of Concord grapes, two and three years old, presented attractions, both to the eye and the palate, that will not soon be forgotten. Here, too, was a demonstration of the practicability and profit of grape culture. Before the eye were the luxuriant vines, and every vine had its burden, twenty and thirty pounds to the vine, and every cluster sold at twenty cents per pound.

In respect to neat stock, taking from the exhibition the cows and heifers, very little would be left; but the two or three herds on the grounds were fine specimens of their kinds, and proved the increasing attention that is given to the breeding of cattle in this part of the State. I noticed particularly a herd of Jerseys, bred originally by John B. Moore, Esq., of Concord, and sold by him to J. L. Hurd, which bore the marks not only of careful breeding, but of generous treatment.

The show of horses from the stables of the president of the society was quite extensive, and showed his interest in this important department of stock-raising.

In the organization and management of the society, with due deference to its present able officers, I venture to suggest some alterations. First, the procuring of new grounds and buildings. This, however, I understand, is in a fair way of being accomplished. Second, the devoting of another day to the show. One day is not enough. It makes the whole affair too much one of "all work and no play." These fairs should be pre-eminently the farmers' and mechanics' holiday; but it cannot be so where everything is crowded into one day. Let the show of cattle and the address occupy the first day, and the horses and the public dinner the second. I say public dinner, for this sitting down at leisure at the same board, is one of the strongest ties of social intercourse. And in order to make the influence of the hour what it should be, let woman grace the festive occasion with her presence. Let me assure the good people of Middlesex, if they will adopt this plan of a public dinner on the afternoon of the last day of the fair, with some pleasant speeches at the close, it will tend much to increase the interest in the occasion, as well as help to strengthen the tie of brotherhood which ought always to exist among the members of an agricultural society.

A third suggestion, is a greater division of labor in the management of fairs. I think the society would find that the addition to the officers of the society of an executive committee of five or seven, of whom the president, secretary and treasurer should each count one, would give greater interest to its operations, and so make it more useful.

This committee should be composed of working men, selected from different parts of the county, and it should be understood that they are to use their influence in getting the farmers out with what they have to show; while on fair days each should have his department assigned him, and should make it his special duty to attend to all its details.

The Middlesex County Society has within itself every element of success, both in the character of its members and in the stimulus of a near market for all they can produce. Let these be brought to bear upon its interests as they ought, and it will ever maintain a leading position and influence among its sisters, and which would seem of right to belong to her as the central society of the State.

T. G. HUNTINGTON.

MIDDLESEX NORTH.

As delegate from the State Board of Agriculture, I attended the tenth annual exhibition of the Middlesex North Agricultural Society, held at Lowell, arriving upon the morning of the twenty-eighth of September, and found the show commenced at two o'clock the afternoon previous. We were received by the worthy president, E. P. Spaulding, Esq., who is a genuine live farmer, and not only that, but fully alive to the interests of the society of which he is president, and working with untiring zeal for its prosperity. And we were impressed with the fact that mankind are sympathizing beings, and that the life and genial good farmer feeling of the president extended its influence, and was reciprocated by the happy and interested spirit of all present. There was so much crowded into so short a space of time, that we could not do much more than to give each a passing glance. A brief examination through the hall gave us a view of some one hundred and seventy-seven different specimens of needle-work, wrought with great taste and skill, into various forms and fabrics, both useful and ornamental, embracing affghans, pictures, rugs, quilts, blankets, shirts, skirts, case hair work, wood carvings, hose, needle-work, mats, shawls, ottomans, coverlids, worked collars, fancy baskets, bouquets, tidies, wreaths, sofa pillows, embroidery, toilet cushions, boxes, slippers, crickets,—all beautiful to behold and dazzling to the eye, but less so than the fair countenances of those whose fair hand had wrought the fabrics, and were now inspecting each other's labors. Of bread, there were forty-four entries, and the show there indicated that the ladies could make good bread, as well as ornamental work. The first prize was taken by Mrs. Levi Hancock, and we were informed she had taken the first premiums for three successive years. We noticed that the society wished to make good bread-makers of the young ladies, as there was a premium offered the lady, unmarried, and under twenty years old, who should make the best bread, which premium was taken by one who had been under the instruction of the former named competitor. There were five entries of butter. We saw no cheese. There were eighteen entries of apples; twenty-six of pears; and thirty-two of grapes, plums and peaches. The show of apples, pears, and grapes was very good. The best show of vegetables was awarded to Elijah Corliss, of Bellerica. For the best show of vegetables raised by a lad under sixteen, who performed all of the labor, the award was given to Albert J. Swan, of Lowell. After the hasty inspection of the hall, we witnessed the ploughing of some twelve teams. The work was well done, considering that the ground was too dry to plough to the best advantage. We noticed the side-hill plough working on level ground,—did not come up to our expectation. The interest of spectators in the ploughing, and also in the trial of draft oxen, was greater than we usually see, which, we think, may be accounted for, in part, by the fact that there were no horses to show their speed that day, and most live Yankees like to see things in motion. The trial of draft-oxen was very nicely done, by loading a cart with about two tons of stone, making a load that would be readily handled, and on which oxen could show training, and the driver could show his skill. Unlike what I saw at a show during the fall, where a stone-boat was loaded mountain high with stone, to the extent that no yoke of oxen could budge it one inch, so that the ill-used oxen could only show what they could not do, instead of showing their activity in moving a reasonable load. There were thirty horses on exhibition, shown standing, with no motion; thirteen bulls; seven fat cattle; nine yoke of oxen; eight yoke of steers; twenty-one milch cows; twenty-seven heifers; eleven sheep and ten swine, besides a fine display of fowls, of which the shanghais predominated. There was a premium awarded to Frank H. Peabody, a lad under sixteen years of age, for the best trained pair of steers. We see that in this show, boys are encouraged to train steers and raise crops, and the girls to make good bread. We wish other societies were doing more to encourage the young, and stimulate them to industrious and improved labors. We noticed another improved feature, which we understood originated with the president, Mr. Spaulding, which was that of stanchions, for securing cows and young cattle upon the ground. Posts were securely set, every twelve feet, and two one and one-half inch planks were bolted together, and also bolted to these posts, so that the plank broke joints every six feet,—planks twelve feet long. They were bolted together, with a two inch space left between for the stanchions to play in. The cattle were secured four feet apart, giving a good opportunity to examine them, and also to feed without waste. When the show was over, the plank and stanchions were taken down, and housed for next year, and the posts left standing. We think the above the most desirable method we have ever seen for securing cattle at shows.

Soon after twelve o'clock, dinner was announced, and the holders of dinner tickets, to the number of some three hundred, proceeded to the upper hall, where a good and substantial dinner was served,—not to man alone, for we have an ancient declaration "that it was not good that man should be alone," and there was an help-meet made for him,—and we always like to see that help-meet along with man. That farmers should enjoy the substantial comforts of an agricultural gathering, and leave their wives and daughters behind, is beyond our comprehension, but they were on hand this time, as they always should be, and the busy hum of voices, as they gathered around that festive board, the happy commingling and social, satisfied expression, convinced me that the time-honored annual agricultural festivals of Massachusetts, fostered by the encouraging hand of her treasury, were among some of the leading and desirable traits of that State, whose leading men are the representative men of this age. And, while giving play to their social natures, which, in the daily routine of farm and isolated home labors, are so little called in action. President Spaulding opened the the intellectual field by some pleasant and encouraging remarks, and concluded with the following: "The ladies of Middlesex North—may their usefulness increase, and their numbers never be less." This and other toasts were responded to, Hon. John A. Goodwin, Dr. John C. Bartlett, James Dean, Esq., Hon. Frederick Smyth, Governor of New Hampshire, Hon. J. G. Peabody, Charles O. Perkins, of the State Board, Dea. Otis Adams, Hon. C. L. Knapp, Rev. S. F. Upham, Asa Clement, Esq., Rev. Stillman Barber, Hon. John A. Buttrick, and Rev. B. T. Clark, and Jesse Huse, Esq., recited a very well got up agricultural poem. The remarks of the above named gentlemen were spiced by occasional exercises in music, furnished by the Dunstable cornet band, after which the premiums were declared, and thus ended, successfully, the tenth annual exhibition of the Middlesex North Agricultural Society, and we close with sincere thanks to the worthy President, E. P. Spaulding, for his kind attention, and to Asa Clement, Esq., for the generous hospitality we received at his board. C. O. Perkins.

MIDDLESEX SOUTH.

Agreeably to my appointment, I attended the cattle show and fair of the Middlesex South Agricultural Society, at Framingham, on the 19th and 20th of September, 1865. The weather was fine, and the attendance good, and great interest manifested by the officers and others to have the show pass off successfully. But little was done the first day, except the examination of the animals and articles by the several committees, and the premiums awarded.

The grounds of the society contain about five acres, in which they have a fine building, ninety by sixty feet, having a basement for storage, cooking, &c., over which is a large room for the exhibition of fruits, vegetables, &c., and in the upper story a dining-hall, which, on the second day, was well filled. The society are agitating the subject of an increase of territory, as they think their grounds are altogether too small.

The ploughing-match took place on the morning of the second day. Eight horse-teams and three ox-teams were on the ground to try their skill, and the work was well done, with the exception that some of the ploughing was a little too shallow.

There was a fine collection of animals in the pens. The society are very fortunate in having among their number so many men of means, who take a deep interest in the improvement of neat stock. There were eight thoroughbred bulls and bull calves, of different breeds, and seven milch cows of pure blood.

Now, where the facilities are so good for procuring the services of thoroughbred males, I think the society should cease giving premiums to animals of mixed blood for breeding purposes. Although such animals may have some nice points, and may appear well at a show, their stock cannot be depended upon. There were forty-four heifers upon the ground. What proportion of them were of pure-blood, I do not know, but there were many fine animals among them. Four native or grade cows and four fat cattle ; four entries of working oxen and two of steers. The land in the vicinity being comparatively level, and easily worked with horses, I suppose accounts for the small number of working oxen upon the ground. There were several specimens of grade bulls.

Of sheep there were twelve lots, all very good. Of swine there were sixteen entries of breeding sows and pigs, and twelve fat hogs. The best breeds were represented—Chester County, Columbia County, Suffolk, Mackay and Essex—a show of swine that it would be hard to excel in any part of the Commonwealth.

Of horses, there were two stallions, seven farm horses, two matched horses, six breeding mares, and nine family horses. There were no trials of speed, as the track was only sufficient for the trial of family and carriage horses.

There were forty-nine entries of poultry, and although I saw no statements of great profits, the number of entries served to show the interest taken by the members in that department of the fair.

The implements of agriculture were not as numerous as we usually see at such places. The collection of apples was good for the season, there being 133 entries; also 125 entries of pears, and among them some very fine specimens ; of grapes, 75 entries ; some superior samples of cranberries, one cultivator expecting 100 bushels from one hundred rods of ground. A large collection of preserves and jellies pleased the eye and tempted the palate. Of vegetables there were 105 entries, and the superior samples would be too numerous to mention. There was no cheese, and but few samples of butter, owing, probably, to the fact that many of the farmers are engaged in the sale of milk, either because it is less trouble or more profitable. Articles of domestic manufacture, paintings and drawings, flowers and fancy articles, served to add interest to the show.

Between three and four hundred persons were at the dinner-table, and among them were many ladies, who manifested a commendable interest in the success of the show. The address was delivered by Dr. George B. Loring, in his usual easy and instructive manner ; after which, remarks were made by the president and others. Good order prevailed ; and if the people were not improved by what they saw and heard, it certainly must have been their own fault. Much credit is due to Mr. Grout and others for their polite attentions to me, which made my visit a very pleasant one.

ABEL F. ADAMS.

WORCESTER NORTH.

As delegate from the State Board of Agriculture, and in accordance with the directions of said Board, I wended my way to Fitchburg, to attend the annual exhibition and cattle show of the Worcester North Agricultural Society, at Fitchburg, on Tuesday, Sept. 26th. When I arrived, I learned that only the preliminary arrangements were to be made on that day, and that the show was to be held on Wednesday. From the preparations in the hall, it became evident that nothing was to be left undone by the members of this society, to make their show both interesting and profitable.

From the long continued drought, it was not to be expected that the exhibition of fruit and vegetables would compare favorably with former years; and, indeed, the quantity and quality of apples was inferior; although I was surprised to find as many, and of as good quality as were exhibited. There were some fine specimens of peaches, presented by H. A. Blood, L. Nichols, A. Crocker, and Mrs. Lewis, of Fitchburg. The show of pears and grapes was very fine, and it was remarked by gentlemen present, who are familiar with these varieties of fruit, that they had never seen a finer display. Dr. Fisher, of Fitchburg, exhibited specimens of the Concord grape, from his vineyard of two acres, from which it was estimated that the product would amount to four tons, and that they would, probably, bring in market, twenty cents per pound, making a nice little income of $1,600.

Mr. Merriam exhibited specimens from his three acre field, of onions, squashes, tomatoes and cabbages, to which the attention of your delegate was directed. The principal product of the field was onions. They were raised on land, part of which was ploughed at the "fair" the previous year. At a distance of about forty feet, the small pieces of turf were raked in ridges, and on these ridges was grown the squashes, tomatoes, and cabbages. From what had been sold from the field previous to the fair, it was estimated that the product of the field would amount to from ten to twelve hundred dollars, showing, also, a nice little income from a small amount of land. I was not able to learn the net profit, but presume it must have been satisfactory. The show of flowers added to the beauty of the exhibition. The many fancy articles showed the skill and handiwork of the ladies. Also, various mechanical implements, which showed great skill in their construction.

Wednesday, the regular day of the show, was a beautiful day, except the dust, from the long continued dry weather. At an early hour, crowds of people were seen coming in from the various directions, showing their interest in the exhibition. First on the programme was the ploughing match. The improvement in ploughs, and the manner of using them, is very marked. As this is the first work to be performed in the cultivation of the soil, it is necessary to do this part of the work in such a manner as to render the cultivation comparatively easy during the whole season after. Perhaps there is no greater improvement in any of our agricultural implements, than in the plough and he who will not avail himself of these improvements must put the more strength to cultivating his fields, during the whole year.

Next in order was the trial of working oxen in managing a loaded cart, by drawing and backing. I noticed here that each load was in proportion to the weight of the oxen, one-third more than their weight being added to the load. This was readily done by having blocks of stone, with the weight marked upon them, so that the load could be arranged by adding to, or taking from, as the case required. This I consider the most equal way of testing working oxen, the heavy ones having no advantage over the lighter ones.

The exhibition of draft horses must have been very satisfactory. I could not but feel that the horse is very likely to be undervalued. Such strength exhibited, such perfect obedience to the will of his master, it seems almost cruel that they should be taxed to the utmost of their strength. What we wish to see is their thorough training and obedience to the will of the master, and to manage a reasonable load.

An interesting feature of the show, and one that drew the crowd, and attracted, perhaps, more attention than any other, was two town teams, one of twenty-six yoke of oxen, from Fitchburg, the other one, of eighteen yoke of oxen, from Leominster. They were headed by the cornet band from Winchendon, and marched around the common to the step of music. Although the Fitchburg team had eight yoke more than the Leominster team, still the latter were able to draw the most, for while the former drew only ten dollars, the latter, with ease, drew twenty-five. This is an interesting feature of any show, and I am surprised that more towns do not collect and exhibit their working oxen at our "fairs" as town teams, as well as upon the cart, or plough.

At the pens, there was a very good show of animals, although the number was not as large as at some of our shows. There were twenty-seven head of pure-blood cattle. There were Durhams, Devons, Alderneys and Ayrshires. There were thirty-one milch cows; twenty-three heifers and heifer calves; eighteen two and three year old steers; fourteen yearling steers and calves; and twenty-five fat cattle on exhibition. Breeding-mares and colts were numerous. I noticed some very fine colts. Sheep and swine were not numerous.

At half past one o'clock, members of the society, and others, repaired to the Fitchburg hotel, and partook of a bountiful repast, prepared by its proprietor, Col. Day, after which there was a call for assembling at the town hall, where it was expected our present governor, A. H. Bullock, would be present to address the audience. But to the disappointment of all, the governor did not appear. The society was addressed by its worthy president, Ohio H. Whitney, Esq., and others, after which, the attention was called to the various reports of the committees.

The officers of the society are deserving of credit for the prompt and energetic manner in which the programme was carried into execution. I feel under special obligation to the president of the society, Ohio H. Whitney, Esq., and others, for the very cordial manner in which I was received, as your delegate, and their many attentions to make my visit agreeable, as well as profitable.

NEWTON S. HUBBARD.

WORCESTER SOUTH.

On the morning of October 5, 1865, your delegate might have been seen quietly wending his way towards the common of the centre of the town of Sturbridge.

The day previous had been similar to many others of this season of drought, when it seemed as though that great blessing, so much desired and prayed for, (showers to water the earth,) was near at hand; but the clouds had been scattered, and this was the morning of the day which was to witness the eleventh anniversary of the Worcester South Agricultural Society.

Well do we recollect when the first animal appeared, proudly marching towards the grounds which were soon to be occupied by others of his kind, appearing to have the feeling within himself that upon him rested the responsibility of the success of the show. It was not long before men and beasts, in quite a number, were gathering together.

I was soon so fortunate as to recognize the pleasant face of the president of the society, who is also the delegate to this Board. He introduced me to Dr. Hartwell, the friend of every one—the guardian of the anxious and aimless. I was invited by him to witness the first exercise of the day—the ploughing-match. Repairing immediately to the ground selected for this purpose, we found the competitors, ten in number, all with single ox-teams, with their lots drawn, ready to commence.

There seemed to be considerable interest manifested in this exercise, both by spectator and competitor, and although it is not necessary nor best to particularize, for all performed their work well, notwithstanding there was a difference in the lots drawn, yet I cannot forbear to speak of the ease and grace with which the plough was held, and the workmanlike manner in which the furrows were turned, by A. J. Hooker, of Brimfield.

The trial of steers and working oxen was such as to show that the animals had been subject to good training, and to the satisfaction of a crowd of spectators.

Mr. J. A. Webber, of Holland, exhibited a pair of three years old steers, very well trained.

An attractive part of the show was the exhibition of the Brimfield town team, consisting of 24 pairs of oxen, which, headed by the Spencer Band, marched around the common.

After the trial of working oxen, the multitude repaired to the church to listen to the address, which, after a few timely remarks by the president, was given by Dr. Geo. B. Loring, of Salem. After the address came the dinner, which, like everything else pertaining to the exercises of the day, was in time, also abundant, and "all very good."

The stock department, taken as a whole, was quite creditable. Very good pairs of oxen were exhibited by D. B. Kingsbury, of Dudley, M. D. Williams and Liberty Stone, of Charlton. Silas Herring, of Brimfield, "the safe man," exhibited a fine pair of four years old steers, weighing 3,300 pounds.

B. J. Stone, of Sturbridge, whose fame has gone through New England as a raiser of Ayrshires, exhibited a splendid herd, 22 in number, of full blood, and grade Ayrshire cows and heifers, with one pair of grade four years old oxen.

To Provostus McKinstry, of Southbridge, belongs much credit, for the forty animals contributed by him to the show, including one bull, Durham and Devon, four years old; also very good cows, two year olds and yearlings, and twenty-six spring calves, which reminded me of the old adage, "Take care of the pence and the pounds will take care of themselves." If there are no calves reared, where shall we look for the cows, steers and oxen? Very fine herds were exhibited by Simon Carpenter, of Charlton, and Dexter Nichols, of Sturbridge.

The show of sheep, though not large, was very good. Specimens of grade Southdown and Cotswold were exhibited by L. Shumway and E. T. Morse, of Southbridge.

Some fine specimens of swine were on exhibition. A good sow and ten pigs, belonging to Samuel H. Hobbs, of Sturbridge; also fine broods belonging to W. D. Bell, of Warren, and B. J. Stone, of Sturbridge, and a boar belonging to J. W. Lawrence, of Sturbridge.

The exhibition in the hall was said, by those who were able to judge, to surpass that of previous years. The departments containing needle and ornamental work, mechanic arts, horticulture, floriculture, bread, butter, cheese, fruit and vegetables, were all such as the society may be proud of.

Sixty-four varieties of pears, and six of apples, were exhibited by D. R. Tyler, of Warren. P. D. Allen, of Warren, exhibited ten varieties of apples and a splendid lot of cranberries. A bed of the latter, as dug from his meadow, and thickly covered with ripe fruit, looked really fine.

The latter part of the day was devoted to the exhibition of horses, and the display was very good; but being obliged to leave during this exercise, I cannot report particulars. Their means of showing the horse are not as good as if the society had grounds of their own, which every agricultural society needs; and I hope the time will soon come when this society will be able to purchase suitable grounds for the exhibition of all their stock.

In conclusion, let me say that the question has often arisen in my own mind, whether there were not too many agricultural societies receiving State patronage? And I will confess, that while on my way to attend the fair of this society, it occurred to me that this might be one which was not of sufficient benefit to the community to justify the expense. But when I witnessed the crowd of people in attendance, all interested in every part of the exhibition, and being able to testify that the different departments of the show and fair were all full, and that the ploughing match, the trial of working oxen, the dinner, the address, the show in the hall, all were entered into with zest, how could I say that the agricultural community of Worcester South were receiving no benefit? The show continued but one day, and I was surprised to see with what promptness every exercise was performed—there was no hurry, but everything on time.

It has been said that the success of an agricultural society, or a farmers' club, depended upon the energy of its officers; and I am inclined to the opinion that this society owes something to its presiding officer.

My thanks are due to the president of the society, to Dr. Hartwell, and Mr. Gray, of the "Southbridge Journal," for courteous attentions.

JOHN M. SMITH.

WORCESTER SOUTH-EAST.

Delegated by the Board to attend the sixth annual show and fair of the Worcester South-East Agricultural Society, I reached the town of Milford, by the first train from Boston, on Tuesday, the twenty-sixth of September, the first day of the fair. Proceeding to the town hall, I found the officers of the society busily engaged, at this early hour, in preparing for the fair.

On the street, the hurrying crowds of people, vehicles of all descriptions, and with all imaginable kinds of occupants, strings of oxen and groups of cattle, all passing in one direction, gave token that some matter of more than ordinary interest was transpiring.

I found that the exhibition of vegetables, fruits, flowers and domestic and fancy articles, was held in the town hall; while the exhibition of stock, and the various trials attendant upon the fair, was upon the grounds of the Charles River Park Association, some three-fourths of a mile from the hall.

The first day of the fair was devoted to the exhibition at the hall and grounds, and to the trials of carriage, farm and trotting horses. Nine single and four double teams of carriage horses exhibited on the grounds, and their appearance and performance was very fine.

The trials on the second day were ploughing, and of working oxen and steers. The ploughing was very spiritedly contested by some dozen teams of oxen and one of horses, and the work very handsomely done, notwithstanding the unfavorable condition of the soil from the extreme dryness.

The trial of draft oxen was very creditable, and their performance gave evidence of thorough and careful training. I was particularly pleased to witness the very great and absorbing interest manifested in these trials, by the crowds of people who at this time had assembled on the grounds.

The exhibition of stock in the pens was good, although not so large as I had anticipated, and as in previous years, as I was assured. There were some good specimens of full blood and grade Jersey, Ayrshire and Durham cattle, of which there were some full-blood bulls particularly worthy of notice. Daniel Pratt, of Milford, exhibited fine grade Jerseys. There were on exhibition some very promising young grade stock from the Milford Farmers' Club Durham bull Fabius. Perry Wood, of Mendon, exhibited matched oxen and steers, well deserving of notice.

The exhibition in the hall was very attractive. The specimens of vegetables and grain crops were very fine, and I was much pleased to notice the almost entire absence, in this department, of those monstrosities of vegetable production which we are too apt to see at these exhibitions, evidencing, to my mind, a just appreciation of what are good products, in the estimation of these exhibitors. The show of apples, perhaps, was good for the season; that of pears very good, fine specimens of several varieties of which were exhibited by D. S. Chapin and S. C. Carpenter, of Milford, and A. Rockwood and George S. Ball, of

Upton. Very choice clusters of luscious grapes were exhibited, the most noticeable of which were Delaware, Diana and Concord, by H. H. Bowers and Amasa Parkhurst, of Milford; a plate of most splendid Dianas, by Mrs. N. Paine, of Milford, and choice Isabellas by C. A. Wheelock, of Uxbridge.

The exhibition of articles of domestic manufacture was very good; some jars of preserved fruits were very noticeable.

The hall was most beautifully and artistically arranged, exceedingly creditable to the committee and the ladies.

The address, by Judge Chapin, of Worcester, on the labor, philosophy, religion and poetry of farming, was a well-written, intelligent, common-sense production, and was listened to by a full and appreciative audience. With an interesting speech from Hon. Oliver Warner, remarks from one or two other gentlemen, and the reading, by the secretary, of the reports of committees, the public exercises of the fair closed.

The weather for the two days of the fair was most delightful, and but for the clouds of dust which constantly filled the air, nothing intervened to mar the pleasures of the occasion. The exhibition, as a whole, was very creditable to this young society, and, as I was assured, in most respects fully equal to those of previous years. The officers of the society appeared to be devoted and untiring in their labors to render the show a success; and in the opinion of your delegate the bounty of the State, in this case, is in the hands of those who make a judicious use of it.

JOHN KENRICK.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

In compliance with the appointment, I attended the cattle show and fair of the Hampshire, Franklin and Hampden Society, held at Northampton, October 5th and 6th.

On entering their grounds, my attention was first drawn to the large number of cattle just from Brighton, intended for stall-feeding the coming winter, many of them good beef at this time.

Messrs. Day Brothers entered a string of fat cattle—nine yoke—decidedly the best matched and largest, as a string, that I have seen. Their average weight was abont 4,500 pounds the pair. They were generally grade Shorthorns. While viewing them, I was led to think if this section can mature such cattle at a profit, taking the calf from the dam say at two months old, and bring them to such proportions at five to seven years, and not cost more than they will sell for, I shall believe this to be the best farming district in the State.

Working oxen were in large strings and single pairs, all showing that much attention had been bestowed on their selection and keeping, as they were in fine order, and by trial proved they had been trained to obey without the use of lash and spur or harsh language. This department is always interesting and profitable.

There were not a large number of milch cows, and not all up to what I had expected. The young stock were good and fine-looking animals, representing four distinct breeds, with grades of Shorthorn and native.

Several very fine bulls were on the ground, one ten months old Shorthorn, a perfect specimen of that breed, belonging to Hon. Paoli Lathrop, of South Hadley Falls. Sheep were mostly grade Southdown and native. The bucks were thoroughbreds, and very good types of the leading breeds.

Swine were mostly mixed breeds. One said to be pure Mackie, belonging to the State Lunatic Hospital, was of monstrous proportions, causing one gentleman to remark, that "he wished his little squaler could be insane." Poultry, as usual, in *feathers* and boxes, were attractive to a large portion of the spectators.

The hall, as ever on these occasions, showed that man's better half was there, with her usual taste and skill, having placed her handiworks in just the right positions. Bread and butter, in quantities and quality, was of the very best. Fruits in much larger quantity than I had expected to see at this farmers' fair. Some specimens of Baldwin apples, even larger than any that I saw at the horticultural exhibition in Boston. Vegetables were in abundance, and of great variety, proving the lands in this county can grow large vegetables as well as large cattle. Corn, on the ear, added largely to the decorations of the hall. Manufactured articles were skirted, (hoop-skirts,) and displayed in divers rugged shapes, (rug-mats.) Fancy work was tastefully got up and beautifully wrought, adding much to the interest in this department.

It would be impossible to enumerate all that was displayed, even allowing that a passing glance could do justice; but without the company and assistance of ladies at these exhibitions, there is fear of their becoming the resort of jockeys and gamblers, to the exclusion of the more worthy portions of the community, thus defeating the proper ends for which these societies were formed.

In the afternoon of the first day, Colonel Needham, of Vermont, delivered an address to a large and attentive audience. His views on New England farming were interesting and instructive.

The second day was devoted generally to the exhibition of horses and their various qualifications. Stallions and brood mares were very fine in character, showing that much attention is bestowed on breeding from the best stock they can get. There were not as many colts as I could wish to see at these shows, for here is the opportunity that farmers have to compare one with another, and thus decide where to improve, if they find that improvement is needed. Family horses were out in large numbers, (and everybody has the best.) Many of them showed good speed and action. Draft horses were fine, well-built animals.

I am happy to say that every department was viewed and passed upon by the several committees and judges with promptness and dispatch, thereby forwarding the business in hand, that all could have proper attention, rendering the whole pleasant and profitable.

At one o'clock a bountiful dinner was served in the upper hall, after which the company were entertained by remarks from several gentlemen, and enlivened with music by the brass band in attendance.

During the two days your delegate did not see or know of a person that was intoxicated, and at times there seemed to be ten thousand or more present; but on all sides good feeling seemed to abound, which confirms my belief that such gatherings are profitable to a farming district, which allows friends to meet once in the year at least. There the toils and business of life are laid aside for a season of pleasure and enjoyment, which renovates and encourages to renewed hope and desire to return, at the next year's fair, with such improvements as shall entitle them to the bounties of the society and State.

In conclusion, I can say the officers of this society are striving to encourage agriculture, in its several departments, with a zeal that is worthy of imitation. To President Porter and other officers and members, and to their former presidents, Hon. Paoli Lathrop and T. G. Huntington, who were ever ready to render information and courtesy, I must return my heartfelt thanks. JAMES THOMPSON.

HAMPSHIRE.

At the request of the delegate appointed by the Board of Agriculture to attend the show of the Hampshire Agricultural Society, I was present on Tuesday and Wednesday, September 26th and 27th. The fair of this society is held at Amherst, upon ground about a mile from the village, upon the lower and level plain east of the college, upon the enclosed ground of the society. A substantial and commodious hall has been erected by the society, and the grounds are large enough for all the purposes of the exhibition. The show of neat stock was good, but I was disappointed in not finding greater interest in the exhibition of the society, shown in the numbers both of cattle and of persons attending the exhibition. The receipts for admittance at the gate, for the two days, were $900. The exhibition of horses, on the second day, was very fine. The whole number of entries in this department was eighty-eight, divided as follows: Stallions, five; carriage horses, thirty-three; mares and colts, four; colts and fillies, eighteen; roadsters, twelve; farm horses, fourteen; for equestrianism, two. In addition to these there were five entries for trotting in the afternoon, after the dinner. In the hall, the show of vegetables was the most remarkable, including a very fine show of potatoes of various kinds. Among them I noticed a new potato, called the Colebrook seedling, which I found in great abundance at the previous exhibition of the society. I have raised this variety during the last season, and find it remarkably prolific, uniform in size, free from rot, thin-skinned, especially fine as a baked potato, of fine grain and flavor, of a red color, and long and full in shape.

The dinner was very well attended, and was graced, with speeches of practical and useful character, by Judge French, Prof. J. Seelye, and the delegate.

Your delegate was much pleased with the show, and was only disappointed in finding so small an exhibition of neat stock, in a district which he had been led to suppose was capable of presenting as fine a show as any other section of the State. CHAS. G. DAVIS.

HIGHLAND.

The sixth annual exhibition of the Highland Agricultural Society was held at Middlefield on the 14th and 15th of September.

This society seems appropriately named, for its park is upon the highest ground in that region, and where we, on this occasion, received a full share of the wind, and a sufficient quantity of the dust which the long continued drought had furnished.

Their hall stands upon the most elevated portion of their grounds, and its flat roof, with a substancial railing around it, afforded ample room and fine prospect for those who sought, during these two days of exhibition, for here they had a full view of the whole fair grounds, and whatever was there exhibited.

Neat stock was the main feature of the show on the first day, and the thirty-five pairs of oxen and steers, in yoke, made a fine display. Most of them were of large size, well proportioned and well matched, and many of them in high condition. Here were steers, four years old, weighing from three thousand to four thousand pounds the pair, and older oxen weighing from four thousand three hundred to four thousand four hundred pounds the pair. We noticed one pair of steers, four years, said to weigh four thousand pounds, sold for five hundred dollars, and a pair of steers, three years old, sold for two hundred and eighty dollars. We also noticed a well matched pair of Devon oxen sold for three hundred dollars. It was evident that the Middlefield farmers, and those of adjacent towns, composing this society, had gained a reputation for raising good stock, and this was fully shown by the number of good judges, and lovers of good stock present, and willing to pay large remunerative prices for it.

The farmers evidently understand what is for their interest, and show their good judgment in raising such cattle, for these are the kind that pay. And I would respectfully suggest, as I certainly felt, in looking at these sturdy oxen, that it would have enhanced the interest of the show if several pairs of them could have been attached to the plough, their owners, as ploughmen, competing for the purse for the best ploughing,—this most important work of farming,—and then have seen them on the loaded cart, thereby showing their training for usefulness on the farm, for a pair of oxen, well trained for the plough and the cart, that can back a load as well as draw one, would be much more valuable than a pair not well trained, and a farmer could well afford to pay a higher price for such, as he would soon save the extra expense in comfort, if not in time, especially if he have a barn cellar into which he wishes to back loads.

Other neat stock was not numerous. For milch cows, Elisha Strong, of Northampton, and Matthew Smith, of Middlefield, took the premiums. Mr. Smith, one of the pioneers of the society, though absent, did not fail to have two good cows and a beautiful Durham heifer present.

The general breed of the cattle was high grade Durhams. I noticed one herd of Devons, eighteen in number, by S. L. Chapman, of Becket, consisting of oxen, cows, steers, heifers, and one bull, and that a small one, and the only one on the grounds.

The show of sheep was small. I had expected to have seen here a full display of this growing adjunct of husbandry. There were two small flocks of Merinos, one of eleven, by M. M. Blake, of Washington, and one of five, by C. H. Bond, of Washington. These were from the famous Hammond stock, of Vermont, which had been introduced for the benefit of breeders in this section. There were a few others, of the fine-woolled, and also a few of the Cotswold, and of these, Lawrence Smith, of Middlefield, exhibited eleven very good ones. No swine exhibited. Of poultry, the show was small.

The only race of the day was that of bipeds. Six competitors started on the course for a foot race, to go once round, it being one-third of a mile. The successful competitor made the time in 1:34, for which he received the premium of three dollars. The two next best, the two other prizes, of two dollars and one dollar.

The cattle were allowed to be driven from the grounds at two o'clock in the afternoon, to give place on the next day to horses.

In the hall, which was open on both days of exhibition, there was the usual variety of articles, useful and ornamental. The part of the hall devoted to flowers and paintings was well filled with fine specimens. A moss monument, filled with flowers, by Mrs. J. McElwain, the worthy lady of the secretary, was quite attractive, as was also a collection of artificial flowers, by Mrs. Laura Root, of Middlefield. There were bread, butter and cheese, honey and maple sugar, that would tempt the appetite of an epicure, and a good display of domestic manufactures, showing that the ladies felt they had a department in which to act and fill, and in this they succeeded.

Of farm and garden production the show was not large, but good. There was a good variety of fruit, such as apples, pears, plums, peaches, quinces and grapes, few in numbers, but of good quality.

A very agreeable feature on this occasion was the social gathering in the hall in the evening. At an early hour the hall was filled, and the entertainment consisted of speeches, interspersed with music. In the absence of the Amherst glee club, Middlefield, in her own sons and daughters, was able to repair all disappointments and supply all difficiencies. Two quartettes sung by the four Smith brothers, sons of Hon. Samuel Smith, of Middlefield, and all graduates of Amherst College, were well received.

Short, pithy speeches were made by the president of the society and others, who readily responded to his call, and the evening thus passed very pleasantly, I doubt not, to all who were favored with the opportunity of being present.

On the second day, at nine o'clock in the forenoon, horses, with a larger gathering of people than on the previous day, occupied the grounds.

The whole number of horses, of all ages, present, was sixty, consisting of stallions, carriage horses, breeding mares with their colts, and business horses; among these were a few well matched, good driving carriage horses.

The stallion, "Old Berkshire," from Becket, was on the ground, and as a stock horse stands high in the estimation of the people in this section of the State. Several of the young horses, and a large number of the colts, exhibited were sired by him, and seemed to partake largely of the characteristics of the horse, and the colts could readily be distinguished as such.

The chief marshal, George K. Huntington, of Becket, exhibited a fine horse of this Berkshire breed, and the president, C. O. Perkins, a good gray mare of the same breed, whom I had the pleasure of riding after several miles.

J. W. Wheeler, of Becket, exhibited, besides a good pair of matched horses, a 400 pounds confiscated Southern-bred pony, that could run with the best of them.

The different classes of horses were driven round the course from the judges' stand to exhibit their training and action, but the track was not in condition to test their speed. It probably will be improved, but the nature of the ground is such that it will be difficult to make a very good trotting course.

The closing exercises of the day were at the Baptist Church, where, after prayer by the Rev. Mr. Rockwood, singing by a select choir, and a few congratulatory remarks by the president on the success of this anniversary cattle show, Hon. Joseph White, of Williamstown, was introduced, who gave a very able address, which was listened to by a full house with much interest. The subject of the address, as announced, was "The Relations of Education to Successful Agriculture." It was partly extemporaneous, but replete with good sense, useful suggestions, and sound instruction.

After the address, the reading the awards of premiums and their distribution, in currency instead of plate, as formerly, to the successful competitors, closed the exercises of this fair.

In conclusion, I would express my acknowledgement to the secretary, Mr. J. McElwain, and his lady, for their kind and hospitable entertainment during my stay there, and also to the president, C. O. Perkins, and others, for their polite attentions, thereby rendering my visit, as delegate to that society, very pleasant. HOLLIS TIDD.

HAMPDEN EAST.

The thirteenth annual exhibition of the Hampden East Agricultural Society was held on the grounds of the society, at Palmer, on Tuesday and Wednesday, October 10th and 11th.

The attendance was not large, but the exhibition of cattle, horses, sheep and swine was very creditable. The number of working oxen was quite large, and included some animals of remarkably good shape and quality. The steers, three and four years old, were especially noticeable, indicating good judgment in breeding and selection, and good care through the drought of the last summer. It would be impossible to enumerate the valuable animals of all classes which appeared on the grounds, and it is enough to say that, in the work of the exhibition, the society is improving constantly, and is exerting a good influence on the farming of that section of the State.

The collection in the hall was excellent, and besides presenting many specimens of careful cultivation on the part of the farmers, also contained much evidence of diligent attention to all the domestic economy of the farm, from the wives and daughters. The butter and cheese on exhibition were unusually good.

The fair was admirably conducted by the officers of the society. The address was delivered by Hon. Henry F. French, President of the Massachusetts Agricultural College, and was particularly devoted to the existing necessity for practical agricultural education, and the designs of the college in that direction. It was a timely appeal to the intelligence of the farmers present, to support and encourage the college in its endeavors after usefulness. Its suggestions were delivered to an attentive and interested audience.

GEO. B. LORING.

FRANKLIN.

I attended the Franklin County Agricultural Exhibition, commencing the 28th of September, as directed by this Board, and submit the following report:

Franklin County is well known to be divided by the Connecticut River into two portions, very distinct and unequal in their geological characteristics, as well as unequal in territorial limits; that part east of the Connecticut River having mostly a broken and hilly surface, with a granite soil, and wanting very essentially in those elements of fertility and production so conspicuous in that portion of the county lying west of the river.

The westerly section of the county is very different in its geological formation, with a rock basis of the "Tertiary period," its soil, when developed, is rich in all those elements which the farmer needs in his pastures and in his tillage land. Therefore, the same application of skill and industry to both sections of the county must always result largely in favor of the farmer whose lands have a rock basis of the mica slate, rather than a granite character. On the former the cattle will have more bone, more muscle and fat, and a more perfectly developed form; the sheep will have finer wool and a better carcase; nor will the horse fail to exhibit his share of the benefits of these bounties of nature. But to the farmers comes the monition "to whom much is given, of him much will be required." Nor has the farmer on the granite soil a right to fold his talents in a napkin, and refuse to sow or reap. The simple but significant maxim that "he who makes two blades of grass grow where but one grew before is a benefactor of mankind," has a special reference to the agriculturist, and implies a duty which no farmer, wherever located, has a right to discard.

These views induce me to notice particularly one characteristic of the Franklin County show. Not a hoof of neat stock or sheep was exhibited from east of the Connecticut River, and very few horses, of which six took premiums. Other departments of the exhibition were very creditably, though sparsely represented. It appears to me it would be well for the society to extend some additional encouragement to their less favored brethren on the easterly side of the river, and thereby more widely diffuse its usefulness. But the show of the society for this year, in all its departments, was very complete and remarkably successful; highly creditable to the county and well worthy the favors of the Commonwealth. And I have no doubt the criticisms and suggestions I have here offered will be received in the same kindly spirit by the public-spirited managers of the society, in which they are made.

The show of neat stock was very large, embracing about three hundred and fifty head of all classes and ages, and I doubt if the same could be equalled or excelled by any other show in New England, and a few choice animals might be considered creditable rivals for any of their kind and class in America.

The town team from Deerfield numbered twenty pairs of oxen, showing a gross weight of seventy-two thousand eight hundred and twenty-five pounds, averaging three thousand five hundred and ninety-one pounds to the pair; the heaviest weighing four thousand one hundred and eighty-five pounds, and the lightest, a pair of two year old steers, weighing two thousand four hundred pounds.

One very creditable feature of the exhibition of neat stock, to my mind, was that many of the farmers did not select a few of the best of their cattle for exhibition, but drove their whole herds, to show what it was in these times to have a good stock of cattle. D. O. Fisk, of Shelburne, showed a herd of grade Durhams, forty-five in number; O. O. Bardwell, one of twenty-five; William Long and Son, one of twenty-seven; D. and H. Wells, one of seventeen; R. and J. Anderson, a famous herd of twenty-four—one pair of three year old heifers, weighing three thousand six hundred. Josiah Fogg, of Deerfield, exhibited a thoroughbred herd of twelve Shorthorns. Samuel Fisk and Son, of Shelburne, exhibited two pairs of two year old steers, weighing respectively, two thousand eight hundred and ninety and two thousand six hundred and sixty. The Shelburne cattle are grades of the Northumberland stock. The show of bulls was very satisfactory, embracing Shorthorns, Devons, Jerseys and Herefords, whose record for pure blood appeared to be well authenticated, none but pure bloods of their class being allowed premiums in this society.

The show of sheep was an honor to Franklin County, and I think it is not too much to say that, without detracting from the fair share of credit due the enterprising farmers of the county, that the chief merit of this grand department of the exhibition is due to the energy and public spirit of James S. Grinnell, Esq. The whole number of sheep was set down at six hundred and sixty-one, including Merinos, Southdowns, Cotswolds, &c., and among them, some very superior animals of their kind. No person connected with sheep husbandry could go away from this exhibition without being instructed.

The show of swine was good, embracing some thirteen entries of the Chester County and Yorkshire breeds, and at present prices,—twenty cents per pound, dead weight,—enough to make any person a lover of good porkers.

The show of poultry embraced a great variety, and was very creditable. Farm implements were exhibited in considerable variety, and some of new and apparently improved patterns.

From the show grounds we turn to the hall, to witness the display of fruits, vegetables, flowers and fancy articles, besides a great variety of substantial things too numerous to mention. If the apple failed to some extent, it seemed to be made up by the very excellent display of grapes, pears and peaches.

The ladies of this association are entitled to great credit too, for their exhibition of nice butter, home-made cloth for farmers' wear, beautiful specimens of fine needle-work and fancy articles, and bouquets of flowers of rare beauty, showing good culture, and good taste for adorning and making attractive our rural homes.

At two o'clock on the first day the Hon. Joseph White addressed the large audience, from the president's stand, on the grounds of the society. His address was replete with practical good sense, and instruction to the farmer, and all who heard it.

The second day was devoted exclusively to the horse, and the exhibition of the famous stallion "Flying Cloud" and his progeny was the most interesting part of this department. There were twenty-four of his descendents, with their dams. The whole number of horses on exhibition was one hundred and seventy-five, and he was shown for nearly all the uses to which he is adapted. The show was good, but the heat of the weather and the dust prevented that complete display of the different qualities of the horse which was expected. Very little of fast driving was had, but enough to show the speed and power of some of the choice animals on the track.

It was very gratifying to witness so much good order and sobriety among so many people for two successive days. All the arrangements were carried out with promptness and great efficacy; and I cannot close this report without noticing the whole-souled kindness and courtesy of the president and secretary of the society, and also of J. S. Grinnell, Esq., and W. T. Davis, Esq., and others. ELIAS GROUT.

BERKSHIRE.

As a delegate of the Board of Agriculture, I attended the exhibition of the Berkshire County Agricultural Society for 1865, at Pittsfield, on the 3d, 4th and 5th days of October.

The first day's exhibition consisted of neat stock, sheep, swine and the varied products of the fields, orchards, dairies, workshops and firesides of the county. The second day was devoted to the exhibition of horses of all grades and classes, from the suckling colt to those who have earned celebrity on the turf. The third, to the ploughing match, to the address by Prof. Bascom, of Williams College, the distribution of premiums awarded, and the trials of speed on the track.

I found the working machinery of the society in excellent order, and in the hands of officers of tact, energy and intelligence. The great purposes and objects for which our societies are incorporated seemed to be fully understood, and every department of agricultural industry had its appropriate place and encouragement. There were abundant indications that the society has a strong hold upon the affections and interests of the people of the county, who make its exhibition days not merely seasons of relaxation and amusement, but of opportunities for the acquisition of valuable information; and that that interest was continued through the year, by being, habitually, competitors for its premiums on crops.

The whole number of entries for these premiums was 226, which embraced nearly every variety of grain, vegetable and root. The officers of the society complain, with much apparent reason, that the present regulation for weighing and measuring crops is a great burden, on account of the extended field of their operations, and the large number of crops entered.

The show of neat stock was large and of excellent quality. A healthy spirit of competition was clearly manifest on the part of competitors, as well as nice judgment and skill in the selection and rearing of the animals. Very great interest, and almost excitement, was shown in the department of sheep husbandry. There were specimens of every grade and variety—fine-woolled, coarse-woolled and medium—amounting, in the aggregate, to four hundred animals. In the departments of swine and poultry, the ploughing match, in the hall, with its endless variety, the exhibitions were of a high order and every way commendable.

The striking features of the exhibitions of this society are, the paying of the premiums to the successful competitors, in plate, in the hall on the last day of the show, in the presence of the assembled multitude, and the very general competition for the premiums on crops. The scene of the plate distribution, its interest and influences, are very striking and instructive, but have been described by former delegates. The very great interest in crop premiums is a sure indication of the wide influence of the society, and of the healthy, prosperous condition of its agriculture.

The society is evidently guided by wise councils, accomplishing great good, and distributing the bounty of the State in accordance with the spirit and letter of the law. LEVI STOCKBRIDGE.

HOUSATONIC.

As delegate from the Board, I attended the twenty-fourth annual exhibition of this society, at Great Barrington, on the 27th, 28th and 29th of September.

The facilities of the Housatonic society for holding their exhibitions, in the way of ground and buildings, are ample and commodious, and the exhibition, on this occasion, was well sustained by the farmers of Southern Berkshire, both in contributions of stock and farm products, and in attendance. The stock, although not numerous, was of excellent quality, and in most instances presented to the eye manifest evidence of improvement from the introduction of pure-bred animals for breeding.

I noticed one inconsistency in the award of premiums on stock, which I think the society will do well to correct. The first premium on native bulls was awarded to one which was evidently a *high grade*, a class which, at the present time, is quite commonly discarded for breeding purposes, and which, we believe, should not be encouraged by our agricultural societies. If premiums are offered for native bulls, the awards should be confined to such; in which case probably few would be awarded.

The exhibition of dairy products was large and of excellent quality. The ploughing-match attracted a good degree of interest, and the ground being in a bad state to plough, from the extreme drought, was well adapted to develop the skill of the ploughmen.

In conclusion, I desire to express to the Board my conviction that this society is accomplishing, diligently and successfully, the work of improving and encouraging the agriculture of the district.

P. STEDMAN.

NORFOLK.

The undersigned, substituted for Sylvander Johnson to visit the seventeenth annual cattle show and fair of the Norfolk Agricultural Society, held at Dedham, on Thursday and Friday, September 28th and 29th, 1865, attended, and submits the following brief report:

The first was a preliminary day, although nearly all the articles and animals were on exhibition. The ploughing-match also was held on the first day. There were eleven competitors, viz.: 1 four-horse team, 3 three-horse teams, 2 two-horse teams, 4 teams with one yoke of oxen and a horse, and 1 team of a single yoke of oxen. The work was all well done, although the land was badly prepared and very dry.

The show of thoroughbred Jersey cattle was the best we have ever seen, comprising ten bulls and twenty-nine cows and heifers, contributed by six competitors. Another family of cows pleased us very much. They call it the "Jamestown breed." Its history is something like this. Some years since it will be remembered that the good people of Boston loaded a ship, called the Jamestown, with provisions for the starving poor of Ireland. The captain of the vessel was presented with a *polled* cow, probably of the Suffolk breed. This cow was brought to Norfolk County and graded with the Jersey bulls, and most of the produce now resemble the Jersey full-bloods, except they are all "*dodded.*"

There were thirteen or fourteen specimens of this stock on exhibition; they appeared like good milkers, but we could gain no information on the subject. There were some fair grades of the other breeds. The working oxen were nearly all large and fine. But few steers were on exhibition.

There were some fine specimens of sheep of the mutton breeds, Southdowns, Cotswolds and Leicesters, making a very creditable show. The exhibition of swine and poultry was very good, but not quite up to what Norfolk has done, and may do again.

The exhibition of horses was good, and showed a fair amount of pride in this department.

The noble Percheron or Norman horses, imported by the Massachusetts Society for promoting agriculture, from La Perche, France, were on the ground, and attracted a large share of attention and discussion. They are certainly wonderful animals, and their powerful, nervous step is surprising. They weigh from twelve to sixteen hundred pounds.

The hall was well filled with the handiwork of the ladies of the society. The horticultural department and floral display were creditable. Apples were scarce, of course, but pears and grapes were very fine.

The vegetables and grains were fully up to the usual display.

We were *called to dinner* at about one o'clock. The large hall was well filled with guests, and the table bountifully supplied with good cheer. The president was again at his post, which he had been prevented from honoring by a severe illness. He presided with his usual grace and urbanity.

The address of Rev. Dr. James Freeman Clarke was both eloquent, amusing and instructive. A hymn by Mr. Sanborn was sung, and the usual speeches were made and premiums awarded, when the society adjourned. The society and guests departed, well pleased with themselves and each other, and with cattle show day.

H. R. Keith.

BRISTOL.

According to the appointment of the State Board of Agriculture, I attended the fair of the Bristol Agricultural Society, held at Taunton, the third, fourth and fifth of October last. Receiving no notice or invitation from the officers of the society, and being unacquainted with the duties of a delegate, this being my first experience in such matters, I hardly knew what was necessary to be done, but presuming the object of my appointment was to examine what was on exhibition, and to report to the Board, I started for the scene of action, and on the first day of the exhibition presented myself at the gate of the society's grounds, and by the payment of sixty-five cents for myself and team, I was admitted to the grounds where the exhibition was to be held. I found a spacious field of, I should say, fifty acres, enclosed by a neat and substantial board fence, with suitable pens for the stock on exhibition; large and commodious stalls or sheds for the accommodation of horses belonging to the visitors; a fine building, with large rooms, for the exhibition of manufactured articles, fruits and vegetables, and a large hall, suitable to have addresses or dinners in; a large and commodious race course; an innumerable number of booths, well stocked with both solids and fluids for the benefit of the inner man; and last, but not least, large and clean walks or privies for the accommodation of visitors, a necessity which some of our societies would do well to imitate. Although the first day of the fair, the attendance of the people was large. Everybody, with their wives and children, seemed to be there, and it did one *good* to see with what zest every one entered into the spirit of the exhibition. They seemed to feel that it was what it professed to be,—a farmer's holiday. I was much pleased with the good order that prevailed during my entire stay. Although numerous hurdy-gurdies,—

the fat woman ; live snakes ; the happy family ; " R. T. Muss " Ward's, or somebody's else wax figures,—and a hundred and one other things were to be seen, and the price of admission only twenty-five cents, still, everything was orderly and quiet, and during the entire day we heard no profanity or obscene language that would shock the ear of the most fastidious, a fact that speaks well for the farmers and mechanics of Bristol County.

The show of cattle was remarkably good. There were the Shorthorns, Jerseys, Ayrshires and natives, all showing care in breeding and good keeping. I hardly expected, from what I knew of the soil of Bristol County, to see so large and fat cattle as were presented for exhibition. One pair of oxen, owned by Jonathan Slade, would be hard to beat by even the river counties. Two pairs of Shorthorn oxen from the farm of the lunatic hospital at Taunton show that the managers of that institution know how to select and keep good oxen. There were fine specimens of bulls, cows and young stock, showing that the farmers of this society do not mean to be outdone in the quality of their neat stock. The show of sheep was good. Six lots were on exhibition. One lot of six Southdown sheep were fine specimens.

The show of swine was not large, but of good quality. The show of poultry was the finest I ever witnessed. I undertook to take the number and the varieties presented for exhibition, but gave up in despair. I think " Burnham," of hen-fever notoriety, if he could have been present and witnessed the show, would have taken off his hat.

After examining the stock, I presented myself at the building where the manufactured articles, fruits and vegetables were displayed, and, paying my entrance fee, was admitted. The mechanics of Bristol are entitled to much credit for the variety, quality and number of articles they exhibited. Almost every kind of manufactured goods was on exhibition, and the exquisite finish of the articles speaks well for the skill and ingenuity of the mechanics of Bristol. I had supposed, from the long drought and the light soil of the county, the show of fruits and vegetables would be meagre and of poor quality. But in this I was happily disappointed. All the varieties of vegetables were there in profusion, large in size and excellent in quality. Of fruit there was a large amount and of fair quality.

At three o'clock, P. M., there was a show of horses on the racecourse, both for figure and speed. There were several trials. Style and good motion seemed to be as requisite as speed. There were some fine specimens of horse flesh on exhibition, mostly young. Not one ringboned or spavined old *plug* was seen on the course. They might have been reserved for the last day of the fair.

Business engagements prevented my stopping the two remaining days of the fair. I have no doubt the exercises would have been interesting and instructive.

Thus, in my poor way, have I reported the doings and my observations of the first day of the fair. I was highly pleased with the arrangement and working of the show. Much labor must have been done by the officers and committees of the society, to have had everything go on in such clocklike manner. I heartily commend the promptness with which the programme of the day was carried out. Every one was on time. With such facilities, good grounds, excellent accommodations and faithful officers, I do not see why the annual fairs of the Bristol Society will not be of great value towards developing the agricultural and mechanical resources of the county, and of great practical benefit to the members of the society.

I did not have the pleasure of meeting any of the officers of the Society, having no personal acquaintance with them, and not being notified where they might be found. I would recommend to the Board, in future appointments to visit this society, that persons be selected who are acquainted with its members, as it seems to me it would be more agreeable to the delegate and more beneficial to the society.

VELOROUS TAFT.

PLYMOUTH.

The forty-seventh anniversary of the Plymouth Agricultural Society was held at Bridgewater on the 5th and 6th of October. This exhibition draws together a larger crowd of people, probably, than any county fair in the State. The estimate of the number present on the last day was about fifteen thousand, and there could not have been much less than that. To us the numbers present appeared to be larger than those at Concord on the occasion of the New England Fair, and yet the Plymouth Society has now sixty acres and over in its enclosure, while that at Concord was only about thirty.

This festival, as it was, was eminently successful. The show of stock was not only more extensive, but of a higher quality than any we recollect ever to have seen there before, and yet we were told that there is a great deal of good stock within five miles of Bridgewater that was not exhibited. The entries of stock were no less than 116 head; and those of horses, 44; hogs, 54; sheep, 30.

Most of the blood stock was such as is well adapted to that part of the State. The Ayrshire herd of Harrison Loring, of Duxbury, much, if not all of it, purchased at Peters' sale last spring, was looking finely, and it received the first premium as a herd, which seems to show that the committee rather leaned to the opinion that it was made up of a class of stock eminently suited to the county. The Ayrshire probably yields more milk and profit in proportion to the food consumed than any other breed, and as food is not over abundant in Plymouth, as a general rule, it follows that such an animal would thrive better than a large one there. We hope the herd will be kept together, and form the nucleus of a large and successful breeding establishment, an honor alike to the State, and a public benefit to that part of Plymouth County.

The Jerseys of Seth Bryant, of Joppa, a euphonious locality in East Bridgewater, made a very creditable show and excited a good deal of interest. The oldest cow, the dam of several members of the herd, was imported sixteen years ago, and is still thriving. We consider the Jerseys, also, well adapted to that county, and Mr. Bryant is doing a good service to the public by breeding them so intelligently. The president of the society, Charles G. Davis, Esq., of Plymouth, is also a successful breeder of Jerseys, and some of the butter made from them graced the tables at the dinner on the second day, as rich and beautifully colored and flavored as any we ever saw.

Mr. W. Adams, of Bridgewater, also exhibited a herd of grades, or "natives," which received the third premium, Mr. Bryant taking the second on his Jerseys.

There was a goodly number of entries of single milch cows, many of them of decided excellence. One or two Shorthorn bulls, looking very much as Shorthorns on Plymouth pastures might be expected to look, and one Dutch bull and a large number of heifers and calves really made up a most creditable show of neat stock.

The sheep were few in number and not remarkable in quality. Most farmers in that county would make as great a mistake to select and try to breed Cotswolds as in trying to breed Shorthorns. It can't be done with any profit on thin or second rate pastures. The Cotswold requires luxuriant feed to bring it to perfection, and it is of little use to struggle against nature and try to keep a large animal where it does not belong. Disappointment is inevitable. We had hoped to see a large show of either Merino grades or Southdowns, but looked in vain. Probably, a good lot of common or native ewes, with a close-built, short-legged Southdown ram cross, would produce a class of sheep that would do well in that section, and enable the farmer to turn off a first class quality of mutton, and more or less profit on wool.

The swine were of good quality and made a fine show, and so of the poultry. Neither of these classes were as largely represented as they should have been.

The show in the hall was large and fine. It consisted of vegetables, fruits, flowers, dairy products, domestic manufactures, implements, etc. The butter was of fine quality, and the whole show of dairy products was decidedly creditable. The vegetables consisted of over one hundred entries, of potatoes, squashes, ruta-bagas, etc. This branch of the show was highly attractive.

The display of fruits was extensive, and the grapes were decidedly good, both of hot-house and out-door varieties. This has been a grand season for the grape, and yet, notwithstanding the great abundance of this fruit, the price in our markets is still kept up. Thirty to fifty cents a pound places it beyond the reach of thousands who would be glad to become consumers. We hope to see the time when this luscious and healthful fruit shall be afforded at a price that will bring it within the reach of the people.

The trial of working oxen took place at 9 1-2 o'clock on the first day of the fair, and the ploughing match at 11 o'clock. There were ten entries for ploughing, and the Michigan plough, in the hands of Thomas Smith, of Middleborough, with oxen, drew the first premium, and the same pattern, with horses, drew the first premium, in the hands of Martin Paris, of East Bridgewater. The trial of draft horses, with four entries, took place at 12 o'clock, the first premium for a single horse going to E. G. Ford, of Abington, and for a span to N. Southworth, of East Bridgewater. The trial of family horses took place on the track at 1 1-2 o'clock, the first premium going to Henry A. Hall, of Bridgewater. The afternoon was occupied with trials of speed.

The society met at three o'clock for the election of officers, when Charles G. Davis, Esq., of Plymouth was re-elected President, and Lafayette Keith, of Bridgewater, Secretary, and Van R. Swift, of the same town, Treasurer.

The society is in a strong condition, so far as its finances are concerned. During the present season an addition of fourteen acres of land has been made to its grounds, which are now a fifth larger than Boston Common. The expense of this addition, together with a fine new track, was over four thousand dollars.

The second day brought out, as we have already stated, an immense concourse of people. His Excellency Gov. Andrew, was present at the dinner, which took place in the hall, where six hundred and fifty plates were laid, all of which were occupied. The president, Mr. Davis, opened the entertainment, in some happy, appropriate and eloquent remarks, which were followed by a speech by Gov. Andrew, with his characteristic eloquence and ability. Space, or rather the want of it, does not allow us to give even a synopsis of these speeches. Gov.

Andrew was followed by C. L. Flint, Secretary of the State Board of Agriculture, who spoke mostly upon practical matters relating to the farming of that section, and by Hon. Albert Fearing, of Hingham. Trotting filled up the afternoon.

This exhibition must be regarded as a grand success, and we congratulate the society and its officers, to whom much of this result is due, upon the prosperity of the institution.

D. A. Cleaveland.

BARNSTABLE.

The twenty-second annual exhibition of the Barnstable Agricultural Society was held upon the grounds of the society, at Barnstable, October 3d and 4th.

The first day of the exhibition was occupied in the show of animals upon the grounds of the society, and in arranging the dairy and vegetable products in its spacious and well appointed hall. The ploughing-match and trial of working oxen came off in the afternoon. Three teams of single yokes only were entered for ploughing; and while the grounds furnished by the society to be ploughed were uneven, and had, from the protracted drought, become extremely hard and unyielding, with occasional rocks placed to obstruct the onward progress of the plough, yet the skill exhibited on the part of the ploughmen in encountering and overcoming these obstacles, and in their well-trained teams, gave good proof of the interest taken by the members of this society in this important and necessary part of agriculture.

The display of domestic animals was not as good as I expected to find, and it was remarked by those present as being inferior to former exhibitions, not lacking so much in numbers as in the quality of the stock exhibited. The largest herd was that of Levi L. Goodspeed, of Bridgewater, (from his farm in Barnstable,) being represented in most of the pens. He had a fine full-blood Ayrshire bull; also a good Durham bull, both of which were noble animals and fine specimens of their kinds. Francis Bacon, Esq., and George Marston, of Barnstable, each exhibited Jersey bulls and heifers that were fine animals, and gave evidence of the interest taken by those gentlemen in advancing the agriculture of the county. Of grade animals, Isaiah and Daniel Parker exhibited each a yoke of fat oxen that were very fine. The working oxen, steers, cows, heifers and calves were of fair quality, well proportioned, and gave evidence of improvement. Of the sheep and swine the entries were few, and not calculated to attract especial notice.

The display of horses was not such as I expected to find, being few in number and inferior in quality; and, judging from what I saw of the horses driven by the citizens of the place, I concluded that they could not be fair specimens of the type and style of horses bred and kept by the citizens of Barnstable.

The show of poultry was remarkably fine. A variety of coops of various forms and sizes, filled with fine specimens of geese, ducks, turkeys and chickens of the different species, all entitled to merit, and in quantities far exceeding what we usually find exhibited at our county fairs, showing a great advance in this department of agriculture over Western Massachusetts.

The display of fruits, vegetables and domestic manufactures, in the spacious and well-arranged hall of the society, was very fine, exceeding far our expectations, showing the commendable interest and zeal of the people of Barnstable in the cultivation of the various kinds of vegetables and fruits. Of dairy products, the specimens exhibited were exceedingly fine, and put up with remarkable good taste. Of household manufactures, the entries were numerous and in great variety, exhibiting good skill and a spirit of emulation on the part of the ladies in the manufacture of those articles that are not only practically useful but highly ornamental.

The second, and final day of the exhibition, was enlivened by a visit to the grounds of the Ancient and Honorable Artillery Company, of Boston, who halted on their way to Harwich, whither they were going to participate in celebrating the opening of a portion of the Cape Cod Central Railroad, taking up their line of march directly from the depot to the large upper hall of the society's building, where tables had been prepared for about one thousand, richly laden with all the heart (if not the appetite,) could desire.

After the repast, the president of the society called the assembly to order, and introduced Dr. George B. Loring, who addressed the society upon the subject of "Practical Agricultural Education," congratulating the members upon its prosperous condition, and in a clear, forcible and practical address, that was listened to with profound attention, urging upon the farmers the importance of "lasting benefits to be derived from a proper collection of material facts as a basis upon which to rear a good agricultural education," suggestions that were eminently practical and instructive, and if appreciated as they should be, will be of lasting benefit to the farmers of Barnstable County.

This society is in a prosperous and thriving condition, evidence of which is clearly manifest in all departments of its exhibition not only, but in the conveniently arranged farm buildings and well cultivated fields that attract the notice in passing through the towns.

In conclusion, I desire to express my thanks to the members of the Barnstable Agricultural Society, and especially to their representative president, for the many attentions and kindnesses I received during my brief visit to their annual fair. H. Garfield.

MARTHA'S VINEYARD.

The eighth annual show at Martha's Vineyard was held on the 17th and 18th of October. As a delegate from the Board of Agriculture, I had been careful to ascertain the route and way, to be there in time for the first day's exhibition, as I had found that my predecessors, for the last two years, had failed in being there the first day. The officers of the society had made arrangements to take me from Holmes' Hole to West Tisbury, it being seven miles; but through mistake this failed, and I arrived too late for the first day's show.

I would here say that my knowledge of the Vineyard was quite limited. There are but three towns and only some four thousand inhabitants, all told; but I was led to say that half that number were present on the second day. I found the people very intelligent and social, as far as my intercourse extended, if I may be a judge. There is not as much caste or aristocracy as in many of the more interior sections of the State.

At the first meeting of this society, 1858, as reported, there came some forty young ladies from Holmes' Hole to the fair in a rough carriage drawn by oxen. This company came singing merrily and with much glee, and were received with cheers and good feeling. This calls to my recollection a circumstance noted in George Kendall's Santa Fe Expedition, published some years ago, in which he speaks of meeting the handsomest young lady that he had ever seen, with the exception of one that he saw at Holmes' Hole. Although they have not as ready and as many ways of communication as some other localities, they will not suffer by comparison in most respects and in a moral point, I should think they excel very many sections of our State.

The first day's show, as reported by the secretary, was very good in the various departments—say neat stock, sheep, swine and poultry—although not large in number. There were to be seen four thoroughbred Ayrshire cows and three bulls; also specimens of young stock, pure-bred Ayrshire. I should think that this kind of stock, above all other, is that to propagate on this island. That of sheep, those that best combine mutton and wool.

They awarded premiums for the best cultivated apple and pear orchards, and a large number of premiums on the various kinds of fruit and vegetables; and for apples, pears, quinces, grapes and cranberries, as far as specimens are concerned, not to be beaten in the State; and for quinces and cranberries they stand at the head; I think they will do well to increase the cultivation of these crops.

The first part of the second day was the ploughing and the exhibition of horses. The kind of horses raised and mostly used on the island is such as suit me—many of them of the Morgan breed, and, as we can testify, some of them are splendid roadsters; such as took us from Holmes' Hole to the fair and back—one of them a six years' old Morgan, elegant in gait and fast enough.

At noon adjourned one hour, and, together with the officers and others, sat down to a sumptuous dinner, provided by Henry L. Whiting, Esq., the society's first secretary, and I should think one of its greatest patrons. I noticed, in some of the former reports, that premiums were awarded but not taken. This being the case, shows an interest to benefit their society.

The after part of the day was spent at the hall, which is located on the society's ground, and one of the best show halls in the State. Its dimensions are as follows: The lower floor, constituting the exhibition room, is 50 by 75 feet. The upper hall is used for various purposes. Here we assembled, and the secretary and others held forth in short discussions. After this, we listened to the reading of the award of premiums, which, although not extravagant in amount, numbered in all some two hundred and fifty. I would say, without particularizing, their show was a success in its various departments, and the whole affair very interesting to the subscriber.

A. Homer.

RETURNS

OF

AGRICULTURAL SOCIETIES,

FOR 1865.

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Finances.

SOCIETIES.	Amount received from the Commonwealth.	Income of the permanent fund.	New members and donations.	All other sources.	Receipts for the year.	Premiums offered.	Premiums and gratuities paid.	Current expenses—not including premiums and gratuities — for the year.	Disbursements for the year.	Indebtedness.	Value of real estate.	Value of personal property.	Permanent fund.
Massachusetts, . . .	*	*	-	-	-	-	-	-	-	-	-	-	*
Essex, ...	$600 00	$791 08	$75 00	$2,192 87	$3,658 92	$1,675 00	$537 50	$1,472 02	$1,960 00	-	$5,000 00	$500 00	$14,215 13
Middlesex, ...	600 00	118 39	91 00	764 44	1,573 83	775 00	540 75	837 20	1,410 20	-	3,000 00	2,000 00	5,000 00
Middlesex North, . .	600 00	-	149 00	1,257 98	2,006 98	1,015 00	586 50	879 68	1,906 18	$800 00	6,614 94	665 69	7,280 63
Middlesex South, . .	600 00	-	281 42	972 47	1,863 89	1,022 00	351 96	626 77	1,458 73	2,000 00	7,200 00	1,500 00	8,700 00
Worcester, ...	*600 00	-	310 00	2,575 50	3,485 50	1,532 00	1,039 50	1,337 50	-	5,500 00	18,000 00	600 00	*18,000 00
Worcester West, . .	600 00	175 72	1,172 00	1,076 77	3,024 49	1,005 00	471 40	700 00	6,323 65	3,289 00	7,650 00	2,057 13	5,358 46
Worcester North, . .	600 00	473 95	138 50	534 80	1,747 25	1,359 25	897 67	678 44	1,576 11	-	-	5,500 93	5,500 93
Worcester South, . .	600 00	319 48	58 00	131 50	1,108 98	843 00	609 45	416 31	1,025 76	-	2,300 00	1,912 00	4,212 00
Worcester South-East,	600 00	173 20	69 00	569 34	1,411 54	1,135 00	467 75	823 23	1,290 95	-	-	3,889 97	3,889 97
Hampshire, Hampden & Franklin,	*600 00	240 00	65 00	1,628 99	2,533 99	1,083 25	879 33	1,603 16	2,482 49	3,018 00	7,000 00	5,000 00	*11,000 00
Hampshire, ...	600 00	879 87	100 00	6 50	1,586 37	1,049 50	597 30	690 66	1,287 96	-	5,200 00	925 00	6,125 00
Highland, ...	600 00	100 40	72 00	400 79	1,173 19	649 00	412 00	504 57	889 07	-	2,500 00	1,800 00	4,300 00
Hampden, ...	-	-	62 50	2,434 44	2,557 76	749 50	412 00	2,084 94	2,496 94	9,400 00	28,500 00	500 00	20,000 00
Hampden East, . .	600 00	225 86	57 50	-	883 36	842 20	397 27	189 75	587 02	1,367 76	4,500 00	245 40	4,200 00
Franklin, ...	600 00	80 90	280 00	1,037 62	1,998 52	839 50	580 52	672 28	1,252 80	1,000 00	7,000 00	1,100 00	7,000 00

Housatonic, ...	$600 00	$728 23	$102 00	$2,075 62	$3,505 85	$1,265 50	$1,261 50	$2,353 34	$3,295 84	-	$8,000 00	$1,000 00	$18,000 00
Berkshire, ...	600 00	600 00	232 00	2,350 00	3,782 00	1,594 00	1,460 00	1,097 00	2,557 00	-	10,000 00	2,000 00	10,000 00
Hoosac Valley, . . .	600 00	95 00	874 00	1,174 20	2,743 20	960 50	770 00	2,021 45	2,791 45	$2,800 00	7,000 00	135 00	4,335 00
Norfolk, ...	600 00	-	89 00	2,190 91	2,879 91	1,396 00	487 65	2,451 98	2,939 63	7,400 00	10,414 00	-	5,600 00
Bristol, ...	600 00	-	95 00	4,716 00	5,411 00	2,066 00	1,421 50	3,989 54	5,411 04	7,436 24	23,041 58	800 00	16,405 34
Plymouth, ...	600 00	146 00	341 00	6,291 72	7,378 72	1,772 00	1,610 95	5,000 00	-	4,697 00	22,000 00	1,000 00	22,000 00
Barnstable, ...	600 00	39 00	40 00	934 60	1,613 60	670 00	492 26	1,143 07	1,635 33	521 73	6,000 00	300 00	6,300 00
Nantucket, ...	600 00	149 29	10 00	326 69	1,085 98	805 25	375 75	338 19	452 19	-	3,277 69	667 64	3,945 33
Martha's Vineyard, .	600 00	483 04	259 00	518 17	1,860 20	635 00	276 57	484 81	1,618 83	650 00	3,440 93	2,533 85	5,974 58
Totals, ...	$13,800 00	$5,819 41	$5,022 92	$35,161 22	$60,865 03	$26,638 45	$16,938 08	$32,391 87	$40,619 17	$56,979 73	$197,639 14	$36,632 61	$217,342 37

* Not returned according to law.

Permanent Fund—How Invested.

ESSEX.—In bank stock, railroad bonds.
MIDDLESEX.—In notes secured by mortgage, bank and railroad stock, cash.
MIDDLESEX NORTH.—In land, buildings and personal property.
MIDDLESEX SOUTH.—In buildings and land, and notes receivable.
WORCESTER.—In real estate.
WORCESTER WEST.—In real estate, notes, cattle-pens, personal property and cash.
WORCESTER NORTH.—In bank stock, U. S. bonds, notes, personal property and cash.
WORCESTER SOUTH.—In Agricultural Hall, furniture, fixtures, cash and loans.
WORCESTER SOUTH-EAST.—In notes, furniture and cattle-pens.
HAMPSHIRE, HAMPDEN AND FRANKLIN.—In bonds and mortgages.
HAMPSHIRE.—In hall and grounds.
HIGHLAND.—In real estate, mortgage, U. S. Treasury notes and cash.
HAMPDEN.—In land and buildings.
HAMPDEN EAST.—In real estate, bonds and stock.
FRANKLIN.—In real estate and endorsed notes.
HOUSATONIC.—In real estate, and notes against members bearing annual interest.
BERKSHIRE.—In real estate.
HOOSAC VALLEY.—In real estate.
NORFOLK.—In real estate occupied by the society.
BRISTOL.—In farm, park, buildings and avenue.
PLYMOUTH.—In real estate and furniture.
BARNSTABLE.—In land and buildings, U. S. 5-20 bonds.
NANTUCKET.—In Fair grounds, U. S. bonds, office fixtures and library.
MARTHA'S VINEYARD.—In land, hall, fixtures and notes.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.

For Farms, Farm Improvements, Manures, &c.

SOCIETIES.	For management of farms.*	For draining.	For subsoiling.	For ploughing at the Exhibition.	For reclaiming swamp lands.	For experiments with manures.	For spading.	For hedges and ornamental trees.	For reclaiming old pastures.	For orchards of all kinds.	For cranberries.	For other farm improvements.	Total amount offered for farm improvements.	Total am't awarded for farm improvements.	Total am't actually paid for farm improvements.
Essex,	$15 00	–	–	$61 00	–	–	–	–	$15 00	–	–	–	$225 00	$76 00	$76 00
Middlesex,	–	–	–	39 00	–	–	–	–	–	–	–	–	–	–	–
Middlesex North,	20 00	–	–	43 00	–	–	–	–	–	–	$5 75	–	110 00	20 00	–
Middlesex South,	–	–	–	49 00	$18 00	–	–	–	–	$14 00	10 00	–	217 00	91 00	76 00
Worcester,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester West,	–	–	–	38 00	–	–	–	–	–	–	–	–	180 00	38 00	33 00
Worcester North,	15 00	–	–	47 00	–	–	–	–	–	35 00	–	$19 00*	155 00	116 00	116 00
Worcester South,	–	–	–	29 00	–	$30 00	–	–	–	–	3 25	–	181 25	62 25	62 25
Worcester South-East,	–	–	–	45 00	–	–	–	–	–	–	–	–	209 00	45 00	45 00
Hampshire, Hampden & Franklin,	–	–	–	–	–	–	–	–	–	–	4 50	–	–	–	–
Hampshire,	–	$20 00	–	–	–	–	–	–	–	–	1 75	28 00†	225 00	49 75	1 75
Highland,	–	–	–	–	5 00	15 00	–	–	–	–	–	–	33 00	20 00	20 00
Hampden,	–	–	–	18 00	–	–	–	–	–	–	–	–	121 00	18 00	18 00
Hampden East,	–	–	–	16 00	–	–	–	–	–	–	–	–	164 00	16 00	16 00
Franklin,	–	–	–	–	–	–	–	–	–	–	–	–	26 00	–	–
Housatonic,	–	–	–	39 00	10 00	15 00	–	–	–	24 00	–	–	97 00	88 00	88 00
Berkshire,	–	–	–	36 00	–	15 00	–	–	–	18 00	7 00	–	80 00	76 00	76 00
Hoosac Valley,	–	–	–	–	–	–	–	–	9 00	15 00	–	–	57 00	24 00	24 00
Norfolk,	–	–	–	72 00	–	–	–	–	–	–	–	–	472 00	72 00	101 00
Bristol,	–	–	–	74 00	–	–	–	–	–	–	10 00	15 00‡	515 00	99 00	99 00
Plymouth,	175 00	–	–	48 00	–	–	–	–	–	10 00	–	–	374 00	233 00	99 00
Barnstable,	–	–	–	15 00	–	–	$3 00	–	–	13 00	8 75	–	116 00	39 75	39 75
Nantucket,	–	–	–	7 00	–	–	–	–	–	5 00	–	–	–	§	–
Martha's Vineyard,	–	–	–	4 00	–	–	–	–	–	8 00	6 25	4 75	60 00	23 00	20 75
Totals,	$225 00	$20 00	–	$680 00	$33 00	$75 00	$3 00	–	$24 00	$142 00	$57 25	$66 75	$3,617 25	$1,206 75	$1,011 50

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* $4 for kitchen gardens; $15 for experiments in raising onions.

† For experiments on crops.

‡ For experiments showing the greatest net profit from not less than 1 acre of land.

§ Awards on crops not yet determined.

For Farm Stock.

SOCIETIES.	For Bulls.	For Milch Cows.	For Heifers.	For Calves.	For Working Oxen.	For Steers.	For Fat Cattle.	For Horses.	For Sheep.	For Swine.	For Poultry.	All other Stock.	Total amount offered for Live Stock.	Total am't awarded for Live Stock.	Total am't paid out for Live Stock.
Essex,	$10 00	$20 00	$19 00	-	$30 00	$11 00	$18 00	$128 00	$8 00	$20 00	$10 00	-	$446 00	$274 00	$252 00
Middlesex,	15 00	36 00	36 00	-	18 00	-	16 00	114 00	-	19 00	10 00	*$35 00	363 00	279 00	279 00
Middlesex North,	22 00	85 00	19 00	$9 00	26 00	19 00	16 00	48 00	16 00	22 00	20 00	30 00	436 00	332 00	204 75
Middlesex South,	50 00	34 00	24 00	5 00	11 00	4 00	6 00	93 00	21 00	29 00	33 00	-	364 00	310 00	225 00
Worcester,	18 00	31 00	30 00	-	63 00	51 00	14 00	528 00	39 00	39 00	18 00	†253 00	1,268 00	1,087 00	815 00
Worcester West,	39 00	50 00	16 00	9 00	30 00	25 00	37 00	48 00	10 00	17 00	5 00	43 00	514 00	329 00	288 50
Worcester North,	35 00	62 00	15 00	22 00	27 00	37 50	37 00	105 00	26 00	24 00	18 00	35 00	567 00	443 50	425 00
Worcester South,	34 00	27 00	8 00	5 00	29 00	15 00	18 00	49 00	78 00	24 00	5 50	46 00	381 00	338 50	332 50
Worcester South-East,	18 00	18 00	15 00	6 00	19 00	31 00	8 00	117 00	11 00	31 00	6 00	-	414 50	280 00	241 00
Hampshire, Hampden & Franklin,	50 00	26 00	28 00	12 00	56 00	31 00	84 00	407 00	71 50	25 00	7 50	2 15	782 00	1,001 00	743 83
Hampshire,	25 00	2 50	10 00	8 00	76 00	24 00	20 00	248 00	22 00	20 00	9 00	12 00	504 00	419 50	371 00
Highland,	-	9 00	8 50	3 00	23 00	18 00	19 00	106 00	33 00	-	2 00	30 75	410 75	252 25	252 25
Hampden,	27 00	10 00	15 00	3 00	38 00	24 00	36 00	114 50	24 00	19 00	7 50	-	472 50	362 00	295 75
Hampden East,	11 00	18 00	13 00	1 50	27 00	19 00	7 00	40 00	25 00	10 00	11 00	-	312 00	197 00	197 00
Franklin,	31 00	-	11 00	11 00	19 00	39 00	-	186 00	67 00	19 00	5 00	-	586 50	534 00	467 50
Housatonic,	29 00	46 00	13 00	6 00	54 00	12 00	22 00	92 00	49 00	21 00	20 00	28 00	432 00	384 00	384 00
Berkshire,	31 00	39 00	30 00	12 00	45 00	34 00	24 00	346 00	102 00	33 00	30 00	50 00	895 00	776 00	770 00
Hoosac Valley,	17 00	6 00	9 00	6 00	19 00	15 00	15 00	124 00	62 00	14 00	16 00	-	494 00	303 00	303 00
Norfolk,	21 00	11 00	6 00	-	12 00	5 00	-	183 00	25 00	55 00	29 00	-	506 00	349 00	195 00
Bristol,	40 00	57 00	30 00	8 00	56 00	45 00	55 00	453 00	21 00	12 00	26 50	16 50	825 00	820 00	820 00
Plymouth,	44 00	85 00	29 50	18 00	30 00	-	43 00	447 00	25 00	28 00	16 00	-	865 00	773 00	548 50
Barnstable,	15 00	12 00	9 00	5 00	15 00	5 00	48 00	8 00	21 00	12 00	17 00	‡38 00	247 00	205 00	205 00
Nantucket,	45 00	37 00	10 00	-	9 00	5 00	-	126 00	5 00	-	13 00	-	353 00	250 00	250 00
Martha's Vineyard,	10 00	12 00	9 75	2 25	6 00	7 00	11 50	17 50	16 00	3 00	2 75	9 50	261 00	107 25	94 02
Totals,	$638 00	$736 50	$402 75	$161 75	$738 00	$476 50	$554 50	$4,127 00	$757 00	$507 00	$337 75	$628 90	$12,699 25	$10,406 00	$9,159 60

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* For herds.

† $218 for thoroughbred stock.

‡ Stud, $7; mares and colts, $31.

Analysis of Premiums and Gratuities Awarded—Continued.

For Farm Products.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Beans.	Grass Crops.	Grass Seeds.	Potatoes.	Carrots.	Beets.	Parsnips.	English Turnips.	Ruta-Bagas.	Onions.	Other Root Crops.
Essex,	$24 00	–	–	–	–	–	–	–	$8 00	–	–	–	$8 00	–	–	‡$39 00
Middlesex,	3 00	$3 00	$1 00	–	$1 00	–	*$6 00	†$5 00	2 00	$2 00	$3 00	$2 00	1 00	$1 00	$2 00	13 00
Middlesex North,	32 00	–	13 00	–	–	–	–	–	6 00	–	–	–	–	–	8 00	–
Middlesex South,	–	–	4 00	–	–	–	–	–	–	–	–	–	–	–	–	‡36 00
Worcester,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester West,	–	–	–	–	–	–	–	–	75	–	–	–	–	–	–	–
Worcester North,	29 00	–	6 00	$10 00	–	$5 75	–	–	12 75	3 00	1 75	–	1 00	–	1 50	20 25
Worcester South,	–	20 00	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester South-East,	–	–	8 00	5 00	–	–	–	–	–	2 00	–	–	–	–	3 00	17 00
Hampshire, Hampden & Franklin,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hampshire,	5 50	2 00	1 50	1 00	1 00	–	–	1 50	1 50	–	–	1 00	–	1 50	–	–
Highland,	10 00	5 00	–	5 00	–	–	3 00	–	–	3 00	–	–	–	2 00	–	–
Hampden,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17 00
Hampden East,	5 25	1 50	1 25	4 75	1 25	–	1 25	75	1 50	75	75	1 50	–	–	–	–
Franklin,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Housatonic,	43 50	30 00	21 00	12 00	25 00	5 00	15 00	9 00	14 00	–	3 00	–	–	–	50	9 00
Berkshire,	28 00	21 00	21 00	15 00	21 00	6 00	12 00	3 00	22 00	5 00	5 00	–	3 00	5 00	–	–
Hoosac Valley,	15 00	10 00	10 00	14 00	15 00	6 00	–	3 50	15 00	5 00	5 00	–	5 00	–	–	3 00
Norfolk,	–	–	–	–	–	–	–	–	5 00	–	–	–	–	–	–	25 00
Bristol,	36 00	–	–	6 00	–	6 00	–	–	10 00	–	–	–	6 00	6 00	–	33 50
Plymouth,	36 00	5 00	7 00	7 00	7 00	–	–	–	11 00	1 25	–	–	–	–	–	–
Barnstable,	12 00	7 00	–	–	4 00	–	–	–	–	4 00	–	–	7 00	–	4 00	37 75
Nantucket,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Martha's Vineyard,	14 75	75	25	–	75	50	3 00	–	4 50	–	1 50	–	–	–	6 45	10 45
Totals,	$294 00	$104 75	$94 00	$79 75	$76 00	$29 25	$40 25	$22 75	$114 00	$26 00	$20 00	$4 50	$31 00	$15 50	$25 45	$250 95

* Best show of vegetables.

† Second best show of vegetables.

‡ Collection of vegetables.

Farm Products—Concluded.

SOCIETIES.	Total amount offered for Grain and Root Crops.	Total am't awarded for Grain and Root Crops.	Total am't paid for Grain and Root Crops.	Broomcorn Brush.	Fruits.	Flowers.	Any other cultivated Crops.	Milk.	Butter.	Cheese.	Honey.	Wheat Bread.	Rye and Indian Bread.	Corn Bread.	Total amount paid out under the head of Farm Products.
Essex,	$147 00	$40 00	$40 00	-	$93 25	$24 00	-	$10 00	$20 00	-	-	-	$10 00	-	$252 00
Middlesex,	50 00	45 00	45 00	-	70 00	20 00	-	-	16 00	-	-	$11 00	3 00	-	185 00
Middlesex North,	110 00	59 00	13 00	-	88 25	-	$32 25	-	14 00	-	-	12 00	6 00	-	81 25
Middlesex South,	92 00	4 00	-	-	58 00	15 00	-	-	16 00	-	$15 00	3 00	3 00	-	97 75
Worcester,	65 00	72 00	58 00	-	-	-	-	-	54 00	$37 00	-	18 25	-	-	151 50
Worcester West,	52 00	-	-	$0 50	15 00	14 00	12 00	-	-	49 00	-	6 00	6 00	-	92 25
Worcester North,	207 75	91 00	88 50	-	63 50	6 25	10 00	-	13 50	2 00	3 00	4 00	3 50	-	188 75
Worcester South,	50 00	20 00	20 00	-	38 25	5 75	19 85	-	14 00	14 00	1 50	12 00	6 00	-	138 35
Worcester South-East,	222 00	35 00	31 00	-	55 50	9 25	-	-	13 00	7 00	50	5 00	4 00	-	189 25
Hampshire, Hampden & Franklin,	97 00	18 25	11 25	-	53 75	19 50	-	-	10 00	5 00	-	6 50	-	-	-
Hampshire,	47 00	21 50	19 00	1 00	29 50	18 00	1 00	-	11 00	6 00	3 00	3 50	5 50	$3 00	99 13
Highland,	80 00	28 00	28 00	-	7 00	3 00	19 50	3 50	6 50	6 50	1 00	1 50	1 25	-	77 75
Hampden,	151 00	17 00	9 25	-	25 50	1 00	-	-	10 00	10 00	-	3 00	-	-	34 50
Hampden East,	96 95	20 50	20 50	-	14 25	2 50	-	-	15 00	10 00	-	3 00	6 00	-	71 25
Franklin,	38 50	-	-	-	-	16 00	-	-	9 00	1 50	1 50	1 50	3 50	3 50	-
Housatonic,	245 00	202 00	202 00	6 00	41 00	12 00	*44 00	-	15 00	15 00	†7 00	6 00	3 00	3 00	129 00
Berkshire,	167 00	167 00	167 00	-	63 00	10 00	51 00	-	20 00	25 00	6 00	3 00	3 00	3 00	351 00
Hoosac Valley,	174 00	106 50	106 00	-	31 00	6 00	-	-	10 00	24 00	6 00	4 50	4 50	-	292 50
Norfolk,	264 00	30 00	26 00	-	26 00	20 00	-	-	26 00	8 00	3 00	13 00	3 00	-	104 00
Bristol,	263 00	103 50	103 50	-	107 50	9 75	-	-	25 00	20 00	9 00	7 00	3 25	‡16 25	301 25
Plymouth,	139 00	73 00	41 75	-	63 75	28 50	-	-	21 00	21 00	-	6 75	5 75	-	103 25
Barnstable,	134 00	75 75	75 75	-	33 00	13 00	-	-	7 00	5 00	-	8 50	8 00	7 00	157 25
Nantucket,	142 00	§	-	-	29 00	8 00	-	-	13 00	-	2 00	-	-	-	-
Martha's Vineyard,	96 25	43 00	41 50	-	14 75	6 25	11 25	-	15 00	6 00	1 00	2 00	1 50	-	115 50
Totals,	$3,130 65	$1,272 00	$1,147 00	$7 50	$1,020 75	$267 75	$200 85	$13 50	$374 00	$272 00	$63 50	$141 00	$89 75	$35 75	$3,212 48

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* $9 for buckwheat; $6 for cabbages; $29 for hops and tobacco.

† Maple sirup and sugar.

‡ Sundries.

§ Awards on crops not yet determined.

Analysis of Premiums and Gratuities Awarded—Concluded.

Miscellaneous.

SOCIETIES.	Amount awarded for agricultural implements.	Amount offered for the raising of forest trees.	Amount awarded and paid out for the same.	Amount offered for experiments on manures.	Amount awarded for all other objects, strictly agricultural.	Amount awarded for objects other than agricultural.	No. of persons who received premiums and gratuities.
Essex,	$16 00	$30 00	-	$25 00	$200 00*	$97 50	-
Middlesex,	8 00	-	-	-	-	49 75	203
Middlesex North,	7 00	-	-	-	-	43 00	-
Middlesex South,	14 00	80 00	-	25 00	-	105 00	150
Worcester,	93 00	-	-	-	47 00	137 00	172
Worcester West,	20 00	30 00	-	70 00	-	66 90	179
Worcester North,	38 00	50 00	-	-	-	165 50	377
Worcester South,	5 00	35 00	-	75 00	-	78 35	159
Worcester South-East,	-	30 00	-	60 00	-	-	268
Hampshire, Hampden and Franklin,	12 00	20 00	-	-	-	7 75	295
Hampshire,	-	15 00	-	40 00	29 00	78 50	198
Highland,	-	-		-	-	62 00	165
Hampden,	-	15 00	-	-	-	182 50	79
Hampden East,	19 00	25 00	-	73 00	-	13 20	160
Franklin,	9 00	10 00	-	9 00	-	49 25	119
Housatonic,	25 00	-	-	15 00	-	123 50	243
Berkshire,	37 00	-	-	-	48 00	166 00	340
Hoosac Valley,	-	-	-	30 00	-	250 50	200
Norfolk,	9 00	31 00	-	-	-	53 75	145
Bristol,	-	105 00	$8 00	60 00	-	193 25	476
Plymouth,	-	-	-	60 00	-	173 35	314
Barnstable,	8 00	7 00	5 00	-	-	77 26	320
Nantucket,	-	13 00	-	12 00	21 25	41 00	143
Martha's Vineyard,	-	21 00	-	18 00	16 25	40 02	145
Totals,	$320 00	$517 00	$13 00	$572 00	$361 50	$2,326 73	4,850

* $100 for the best means of destroying the canker worm; $100 for the best new apple.

NAMES of the Cities and Towns in which resided the persons when receiving the Premiums and Gratuities awarded by the County Societies, and the several amounts as disbursed.

ESSEX.

Amesbury,	$9 00
Andover,	52 50
Beverly,	1 00
Boxford,	9 50
Bradford,	9 50
Danvers,	89 00
Georgetown,	5 50
Gloucester,	1 00
Groveland,	9 00
Hamilton,	50
Haverhill,	53 50
Ipswich,	50
Lawrence,	146 50
Lynn,	1 00
Lynnfield,	6 00
Marblehead,	$10 25
Methuen,	31 00
Middleton,	18 00
Newbury,	16 00
Newburyport,	12 00
North Andover,	82 00
Rowley,	20 00
Salem,	42 50
South Danvers,	16 00
Topsfield,	11 50
Wenham,	3 00
West Amesbury,	10 00
West Newbury,	45 00
Total,	$708 25

MIDDLESEX.

Acton,	$54 50
Bedford,	15 25
Belmont,	40 75
Billerica,	50
Burlington,	6 00
Cambridge,	19 00
Carlisle,	10 00
Chelmsford,	$3 00
Concord,	142 50
Dedham,	50
Feltonville,	12 00
Framingham,	12 75
Groton,	5 00
Lexington	39 75

MIDDLESEX—Concluded.

Lincoln,	$9 00	Waltham,	$19 50
Littleton,	14 75	Wayland,	8 00
Pepperell,	75	West Cambridge,	27 75
Providence, R. I.,	5 00	Westford,	25
Sherborn,	1 00	Weston,	18 25
Somerville,	1 75	Winchester,	8 00
South Reading,	3 00	Woburn,	8 25
Stow,	11 75	Total,	$530 75
Sudbury,	32 25		

MIDDLESEX NORTH.

Billerica,	$14 50	Pepperell,	$8 75
Chelmsford,	125 00	Tewksbury,	54 00
Dracut,	67 00	Tyngsborough,	69 25
Dunstable,	120 00	Westford,	20 75
Groton,	5 00	Wilmington,	14 25
Lowell,	177 00	Total,	$676 50
North Reading,	1 00		

MIDDLESEX SOUTH.

Ashland,	$9 87	Sherborn,	$6 00
Framingham,	317 61	Southborough,	66 00
Hopkinton,	27 00	Sudbury,	23 75
Holliston,	29 50	Wayland,	34 00
Marlborough	36 00	Out of District,	14 00
Natick,	53 35	Total,	$620 08
Newton,	3 00		

WORCESTER.

Auburn,	$3 00	Oxford,	$7 00
Barre,	53 00	Princeton,	81 00
Charlton,	33 00	Shrewsbury,	7 00
Dudley,	8 00	Spencer,	5 00
East Brookfield,	50 00	Sturbridge,	41 00
Grafton,	54 00	Sutton,	96 00
Holden,	9 00	Westborough,	28 00
Millbury,	82 00	West Boylston,	43 00
Milford,	15 00	Worcester,	383 50
New Braintree,	36 00	Total,	$1,039 50
Northborough,	5 00		

WORCESTER WEST.

Barre,	$304 90	North Brookfield,	$5 00
Boston,	5 00	Oakham,	19 75
Charlton,	23 00	Petersham,	26 50
Dana,	1 50	Templeton,	10 75
Hardwick,	44 25	Worcester,	5 00
Hubbardston,	6 25	Total,	$471 40
New Braintree,	19 50		

WORCESTER NORTH.

Ashburnham,	$14 50	Harvard,	$7 00
Ashby,	7 50	Lancaster,	2 50
Bolton,	4 00	Leominster,	75 00
Fitchburg,	508 42	Littleton,	5 00
Groton,	10 00	Lunenburg,	71 75

WORCESTER NORTH—Concluded.

Princeton,	$127 00	Westminster,	$28 00
Sterling,	22 00	Winchendon,	5 00
South Royalston,	6 00	Total,	$897 67
Templeton,	4 00		

WORCESTER SOUTH.

Brimfield,	$106 40	Southbridge,	$96 50
Brookfield,	11 25	Spencer,	16 75
Charlton,	101 00	Sturbridge,	137 95
Dudley,	65 90	Warren,	41 00
Holland,	21 20	Worcester,	1 00
Leicester,	2 50	Total,	$609 45
Oakham,	8 00		

WORCESTER SOUTH-EAST.

Bellingham,	$9 00	Northborough,	$2 00
Blackstone,	6 00	Southborough,	4 00
Boston,	1 00	Sutton,	3 00
Grafton,	5 00	Westborough,	25 00
Holliston,	35 50	Woonsocket,	1 00
Hopkinton,	37 50	Worcester,	1 00
Medway,	17 75	Wrentham,	12 00
Mendon,	84 50	Upton,	24 75
Milford,	272 00	Uxbridge,	24 00
Natick,	25	Total,	$565 25

HAMPSHIRE, HAMPDEN AND FRANKLIN.

Amherst,	$5 50	Leverett,	$6 50
Ashfield,	7 00	Middlefield,	10 00
Belchertown,	3 00	Northampton,	401 50
Bernardston,	3 00	Plainfield,	3 00
Chesterfield,	3 00	South Deerfield,	3 00
Chicopee,	31 00	South Hadley,	93 00
Conway,	3 00	Southampton,	47 50
Cummington,	5 00	Sunderland,	27 75
Easthampton,	47 50	Westfield,	71 00
Goshen,	6 00	Westhampton,	22 00
Granby,	15 00	Whately,	28 50
Hadley,	90 50	Williamsburg,	51 00
Hatfield,	61 75	Total,	$996 00

HAMPSHIRE.

Amherst,	$225 56	Leverett,	$17 25
Belchertown,	75 00	Northampton,	26 00
Deerfield,	15 00	Pelham,	22 75
Enfield,	5 00	South Hadley,	4 00
Erving,	8 00	Springfield,	24 50
Hadley,	105 00	Sunderland,	68 25
Hatfield,	1 00	Total,	$597 31

HIGHLAND.

Becket,	$116 00	Cummington,	$21 00
Chester,	54 25	Easthampton,	5 00
Chicopee,	2 00	Enfield,	50

HIGHLAND—Concluded.

Hinsdale,	$22 75	Peru,	$20 00
Huntington,	75	Pittsfield,	2 00
Lee,	3 25	Savoy,	1 00
Middlefield,	96 75	Springfield,	50
Monterey,	4 00	Washington,	20 50
Montgomery,	6 00	Worthington,	18 50
North Adams,	75	Total,	$412 00
Northampton,	16 50		

HAMPDEN.

Agawam,	$4 00	Southwick,	$5 00
Brimfield,	5 00	Springfield,	158 50
Chicopee,	30 50	Tolland,	8 00
Holyoke,	5 50	Westfield,	34 50
Longmeadow,	60 00	West Springfield,	39 75
Ludlow,	13 00	Wilbraham,	43 25
Middlefield,	5 00	Total,	$412 00

HAMPDEN EAST.

Belchertown,	$17 00	Pelham,	$145 00
Brimfield,	58 00	Ware,	8 27
Ludlow,	16 00	Wilbraham,	25 00
Monson,	128 00	Total,	$397 27

FRANKLIN.

Colrain,	$11 00	Deerfield,	$123 00
Conway,	75 00	Erving,	4 00

FRANKLIN—Concluded.

Gill, ...	$15 50	Orange, ...	$6 52
Greenfield, ...	101 50	Shelburne, ...	193 50
Leverett, ...	11 00	Sunderland, . . .	18 50
Leyden, ...	5 00	Total, ...	$580 52
Montague, ...	16 00		

HOUSATONIC.

Alford, ...	$44 00	Pittsfield, ...	$2 00
Becket, ...	29 00	Richmond, ...	16 00
Egremont, ...	94 00	Sandisfield, . . .	21 50
Great Barrington, . .	196 00	Sheffield, ...	179 50
Lee, ...	72 50	Stockbridge, . . .	120 00
Lenox, ...	97 00	Tyringham, . . .	5 00
Monterey, ...	22 00	West Stockbridge, . .	11 00
New Marlborough, . .	32 00	Sundries, ...	319 00
North Adams, . . .	1 00	Total, . . .	$1,260 50

BERKSHIRE.

Adams, ...	$45 00	Hancock, ...	$11 50
Alford, ...	6 50	Hinsdale, ...	55 50
Becket, ...	30 50	Lanesborough, . . .	193 50
Cheshire, ...	59 00	Lee, ...	68 00
Clarksburg, ...	3 00	Lenox, ...	151 50
Curtisville, ...	4 00	Monterey, ...	50
Dalton, ...	53 00	New Ashford, . . .	1 50
Egremont, ...	3 00	New Marlborough, . .	2 00
Great Barrington, . .	35 50	Peru, ...	8 00

Berkshire—Concluded.

Pittsfield,	$484 50	Stockbridge,	$84 00
Richmond,	36 00	Washington,	5 00
Savoy,	2 00	Williamstown,	57 00
Sheffield,	18 00	Windsor,	2 00
South Adams,	37 00	Total,	$1,466 00
South Williamstown,	9 00		

HOOSAC VALLEY.

Blackinton,	$20 00	Pownal,	$28 00
Cheshire,	43 00	Savoy,	16 00
Clarksburg,	8 00	Shelburne Falls,	50
Florida,	29 00	South Adams,	119 00
Hinsdale,	4 00	Stamford,	4 00
Lanesborough,	21 50	Williamstown,	165 00
Lenox,	44 50	Windsor,	1 00
North Adams,	264 50	Total,	$770 00
Pittsfield,	2 00		

NORFOLK.

Braintree,	$2 00	Medfield,	$36 00
Brookline,	13 00	Medway,	5 75
Canton,	29 00	Milton,	41 00
Dedham,	88 75	Needham,	166 25
Dorchester,	19 50	Randolph,	20 00
Dover,	57 00	Roxbury,	5 00
Franklin,	11 00	Stoughton,	5 00

NORFOLK—Concluded.

Walpole,	$14 00	Wrentham,	$10 50
West Roxbury,	70 00	Boston,	6 00
Weymouth,	3 00	Total,	$602 75

BRISTOL.

Acushnet,	$4 00	Norton,	$167 50
Attleborough,	23 00	Raynham,	175 75
Berkley,	27 00	Rehoboth,	42 50
Dighton,	15 50	Somerset,	42 00
Easton,	35 00	Swanzey,	3 25
Fall River,	22 00	Taunton,	787 00
Freetown,	1 00	Out of County,	2 75
Mansfield,	19 50	Total,	$1,421 50
New Bedford,	53 75		

PLYMOUTH.

Abington,	$24 64	Marion,	$1 50
Bridgewater,	641 19	Marshfield,	2 00
Duxbury,	41 50	Mattapoisett,	1 00
East Bridgewater,	99 79	Middleborough,	233 57
Halifax,	38 75	North Bridgewater,	82 84
Hanover,	3 00	Plymouth,	58 42
Hanson,	1 00	Plympton,	5 50
Hingham,	50	Rochester,	16 25
Kingston,	4 00	West Bridgewater,	65 85
Lakeville,	123 50	Total,	$1,444 80

BARNSTABLE.

Barnstable,	$422 66	Sandwich,	$21 00
Eastham,	3 00	Yarmouth,	30 60
Falmouth,	10 00	Total,	$492 26
Orleans,	5 00		

NANTUCKET.

Nantucket,	$375 75

MARTHA'S VINEYARD.

Chilmark,	$82 45	Tisbury,	$146 42
Edgartown,	47 70	Total,	$276 57

INDEX

TO THE SECRETARY'S REPORT.

Page.

Adams, A. F., report by, 293, 294
Adaptation of plants to soil, climate, &c., lecture on, 131
Adaptation of the animal to the vegetable kingdom, 142, 143
Agricultural library, 334
Agricultural and other pursuits compared, 62, 68, 188, 191
Agriculture as an employment, lecture on, 187, 192, 196
Alderneys, 31, 37, 38, 40, 49
Apple culture, 177, 178, 248
Apples, characteristics of different, 179, 180
Apple tree borers, 180, 181
Apple tree caterpillars, 182, 183, 228
Apple trees, planting of, 178
Ayrshires and Alderneys, crossing between, 27, 31, 32
Ayrshires, peculiarities of, 28, 38, 39, 41, 42, 49

Bascom, Prof. John, lecture by, 187, 189, 192, 196
Bee culture, 314, 315, 316, 319, 320
Bees, Italian, 317
Berkshire County, agricultural survey of, 310, 311, 317, 320
Berkshire County, principal crops raised in, 311, 312
Berkshire County, thoroughbred stock in, 314
Birds, agricultural value of, 94, 99, 104, 111, 117
Birds, protection for the, 182, 183, 228
Blackbirds, habits and food of, 113, 114
Board of Agriculture, annual meeting at Boston, 197
Board of Agriculture, meeting at Worcester, 23, 197
Bull, E. W., lecture by, 150, 158, 160, 168
Bull, E. W., report by, 323, 327, 329

Cattle breeding, discussion on, 45, 49, 53, 56
Cattle, diseases among, 6, 9, 12, 19, 22, 25, 69, 70, 75, 79, 85, 94, 330, 334
Cattle plague, 334
Capen, Mr., lecture by, 147, 149
Chadbourne, Prof. P. A., lecture by, 57, 61, 64, 69, 131, 147
Cheese, average produce of from milk of one cow, 231
Cheese factories, results of experiments in, 231, 232, 234
Cheese, manufacture of, 234, 236, 237
Cleaveland, D. A., report by, 265, 270, 271
Clement, Asa, report by, 215, 220, 226
Committees on essays, 322
Contagious diseases among catttle, 6, 9, 12, 19, 22
Crows and jays, habits and food of, 114, 115
Cuckoos, agricultural value of, 95, 96, 117

Page.
Dairy, report on the, ... 233
Davis, C. G., report by, ... 271, 276, 282, 283, 285
Delegates, assignment of, ... 321
Drainage, necessity for, ... 210, 213, 215
Drainage, report on, ... 211, 214
Dukes County, agricultural survey of 265, 268, 271
Dukes County, description of, ... 265, 267, 269
Dukes County, thoroughbred stock in, ... 270
Durhams, peculiarities of, ... 28, 41

Enemies to the fruit trees, ... 180, 181, 182, 183, 228
Entomology, ... 332
Examination of sick cattle, ... 8
Experiments with the cattle disease, ... 9, 12, 14, 21

Farm accounts, essay on, ... 239, 243, 246
Fertilization of plants by insects, ... 144, 145
Flint, C. L., lecture by, ... 27, 29, 39, 44
Franklin County, agricultural survey of, ... 306, 309, 310
Franklin County, principal crops raised in, ... 307, 309
Franklin County, thoroughbred stock in, ... 308, 309
Fruit culture, discussion on, ... 150, 168, 170, 177, 184, 186
Fruit culture, report on, ... 226, 229, 230

Gardner, E. M., report by, ... 118, 121
Garfield, H., report by, ... 310, 315, 320
Grape, characteristics of different varieties of, ... 151, 153, 169, 174
Grape culture, discussion on, ... 168, 172, 175, 176
Grape culture, lecture on, ... 150, 153, 158, 162, 168
Grape culture, report on, ... 323, 327, 329
Grape, desirable aspect for growth of the, ... 157, 158, 168
Grape growing profitable, ... 164, 165, 169
Grape, hybridization of the, ... 154, 155
Grape, propagation of the, ... 163
Grape, seedlings of, ... 153, 154, 183, 184
Grape, soil best adapted for culture of the, ... 156, 157

Hampden County, agricultural survey of, ... 304, 305, 306
Hampden County, principal crops raised in, ... 305
Hampden County, thoroughbred stock in, ... 306
Hampshire County, agricultural survey of, ... 297, 300, 304
Hampshire County, systems of agriculture in, ... 300, 303
Hubbard, N. S., report by, ... 294, 297

Importance of selecting superior plants to raise seeds from, ... 250, 252

Keith, H. R., reports by, ... 230, 232, 290, 293

Loring, Dr. George B., address at Worcester, ... 23, 26, 27

Manufacture of cheese, ... 234, 236, 237
Manures and their application, essay on, ... 197, 199, 205
Manures, application of to different crops, ... 203, 204, 206
Manures, discussion on, ... 206, 207, 208
Manures, liquid, value of, ... 198, 199

Page.

Manures, treatment of, 198, 199, 200
Manures, value of, 198, 199, 200, 202
Martha's Vineyard Agricultural Society, 269
Methods of propagating different plants, 248, 250, 251
Meteorology, lecture on, 147, 149
Middlesex County, agricultural survey of, 285, 288, 290
Middlesex County, fruit culture in, 287
Middlesex County, thoroughbred stock in, 289, 290
Milk, quantity of necessary to produce a pound of butter, 231
Milk, report on, 230, 232
Moore, J. B., report by, 285, 288, 290

Nantucket, agricultural survey of, 256, 260, 264
Nantucket, farms in, 261
Nantucket, peat in, 261, 262, 263
Nantucket, thoroughbred stock in, 260
Necessity for farm accounts, 239, 240, 243
New England Agricultural Society, 24

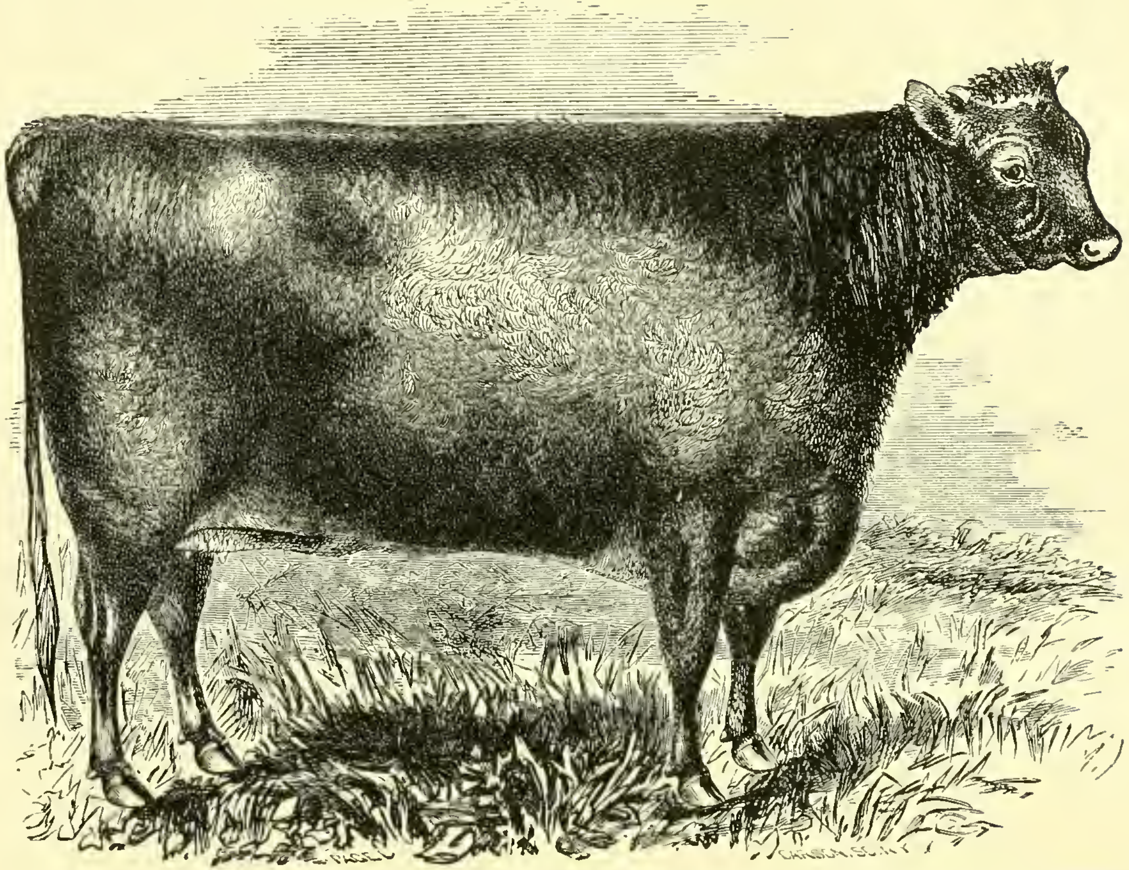
Owls, agricultural value of, 95, 96

Pathological anatomy, 15, 16
Peat, 26, 261, 262, 263
Perkins, C. O., essay by, 239, 244, 246
Plants, adaptation of to soil, climate, &c., lecture on, 130, 136, 142, 147
Plants, fertilization of by insects, 144, 145
Plants, methods of propagating, 247, 250, 252
Plants, structure of, 130, 134, 136, 139
Pigs, statement on, 92
Pleuro-pneumonia, period of incubation of, 17
Pleuro-pneumonia, report of commissioners on, 6, 9, 12, 18, 22
Plymouth County, agricultural survey of, 271, 275, 280, 285
Plymouth County, principal crops raised in, 280
Plymouth County, swine and sheep in, 279
Plymouth County, thoroughbred stock in, 274, 275, 278
Political economy of agriculture, lecture on, 187, 189, 192, 196
Preservation of seeds, 254, 256
Profits of grape culture, 164, 165, 169

Raising and preservation of seeds, report on, 246, 247, 250, 254
Relative value of milk, report on, 230, 232
Robin, agricultural value of the, 102, 105, 110, 112

Saltonstall, L., report by, 211, 215
Samuels, E. A., lecture by, 94, 99, 104, 111, 117
Seeds, plants propagated by, 247, 250, 252
Seeds, raising and preservation of, 246, 247, 250, 254
Sheep, care of, 121, 124, 126
Sheep, effects of on lands, 119, 120
Sheep husbandry, 118, 122, 125, 126, 129
Sheep in Plymouth County, 279
Sheep raising, report on, 118, 120
Sheep, varieties of best adapted to particular purposes, 120
Smith, J. M., report by, 306, 310
State Cabinet, additions to, 331, 333

	Page.
State farms as breeding establishments for distinct classes of stock, lecture on,	27, 39, 44
Stedman, P., essay by,	197, 206
Stedman, P., report by,	304, 306
Swine, diseases among,	330
Swine in Plymouth County,	279
Systematic farm accounts necessary,	239, 240, 242
Thayer, Dr. E. F., report by,	6, 13, 19, 22
Thompson, J., reports by,	226, 230, 256, 260, 265
Thoroughbred stock,	260, 270, 274, 278, 289, 291, 293, 295, 300, 306, 308, 314
Tidd, H., report by,	233, 239
Titmice, habits and food of,	112, 113
United States department of agriculture, Resolution concerning,	320, 321
Vine, Culture of the, (see Grape,)	150, 160, 168, 323, 329
Weight of Crops, reports on,	209, 210
Wine, constituents of,	167
Woodlands and forest trees, report on, 215, 216; preservation of, 216, 217; value of,	217, 218
Woodpeckers, agricultural value of,	97, 99, 101, 180, 183
Wool culture,	26
Worcester County, agricultural survey of,	290, 293, 297
Worcester County, principal crops raised in,	293
Worcester County, thoroughbred stock in,	291, 293, 294, 295



Shorthorn Heifer—"LADY MARY," (taken at one year old.) The property of H. G. WHITE, South Framingham Mass. Winner of sweepstakes open to all comers, and also first prize as yearling at the show of New Eng. Ag. Society, Concord, N. H., Sept., 1865. [For pedigree, see Preface to Abstract.]

ABSTRACT OF RETURNS

OF THE

AGRICULTURAL SOCIETIES

OF

MASSACHUSETTS

1866.

EDITED BY

CHARLES L. FLINT,

SECRETARY OF THE STATE BOARD OF AGRICULTURE.

BOSTON:
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1866.

PREFACE.

The illustrations of Norman horses which adorn this volume were furnished by the Massachusetts Society for Promoting Agriculture, by which the animals were imported from France. For an account of them, see Report for 1864, page 232.

The cuts of Shorthorns were drawn from animals in the herd of H. G. White, of South Framingham. "Dora Haines, 3d," is a red roan, calved May 31, 1864. Got by Monitor, 5,019, out of Dora Haines by Marmion, 1843—Anna by Duke of Exeter, 449, (10,152) (bred in England by J. Stephenson.) Gertrude by Paular, 807—Snowstorm by Duke of Wellington, 55, (3,654) bred by Thomas Bates, Kirkleavington, England—Old Snowstorm by Alexander, 4, (11,099)—bred by Mr. Maynard, and imported by Mr. Remson, N. Y.—Fashion by Otto, (9,463.)

Monitor, 5,019, was bred by S. Thorne. Got by 2d Duke of Thorndale, 2,788, out of Acacia by 2d Grand Duke, 2,181, (12,961,) Aurora (bred in England by Mr. Trotter) by 3d Duke of York, (10,166,) &c.

Marmion, 1,043, by imported Duke of Glo'ster, (11,382,) out of Zoe by 5th Duke of York, (10,168.)

The beautiful red heifer, "Lady Mary," was calved January 27, 1864, got by Hotspur (4,030) out of Baroness by Barrington (1,229)—Red Rose, 2d, by Napier (6,238)—Tube Rose by South Durham (5,281)—Rose Ann by Bellerophon (3,119)—Rosette by Belvedere (1,706)—Red Rose by Waterloo (2,816)—Moss Rose by Baron (58)—Angelina by Phenomenon (491)—Anne Boleyn by Favorite (252)—Princess by Favorite (252)—Brighteyes by Favorite (252)—by Hubback (319)—by Snowden's Bull (612)—by Masterman's Bull (422)—by Harrison's Bull (292)—by the Studley Bull (606.)

It has been found necessary to condense the returns of the Agricultural Societies to a greater extent than usual, while some of them were returned at so late a day that it was found impossible to avail myself of them in the preparation of this Abstract.

C. L. FLINT.

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1866.

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President—JOHN PIERCE, of Edgartown.
Secretary—DAVIS COTTLE, of Tisbury.

AGRICULTURAL EXHIBITIONS.

The Exhibitions of 1866 *begin* on the following days:—

Essex, at *Haverhill*,	Tuesday, Sept. 25th.
Middlesex, at *Concord*,	Thursday, Sept. 20th.
Middlesex North, at *Lowell*,	Thursday, Sept. 27th.
Middlesex South, at *Framingham*,	Tuesday, Sept. 18th.
Worcester, at *Worcester*,	Thursday, Sept. 20th.
Worcester West, at *Barre*,	Thursday, Sept. 27th.
Worcester North, at *Fitchburg*,	Tuesday, Sept. 25th.
Worcester South, at *Sturbridge*,	Thursday, Oct. 4th.
Worcester South-East, at *Milford*,	Tuesday, Sept. 25th.
Hampshire, Franklin and Hampden, at *Northampton*,	Thursday, Oct. 4th.
Hampshire, at *Amherst*,	Tuesday, Sept. 25th.
Highland, at *Middlefield*,	Thursday, Sept. 13th.
Hampden, at *Springfield*,	Tuesday, Oct. 2d.
Hampden East, at *Palmer*,	Tuesday, Oct. 9th.
Franklin, at *Greenfield*,	Thursday, Sept. 27th.
Berkshire, at *Pittsfield*,	Tuesday, Oct. 2d.
Hoosac Valley, at *North Adams*,	Tuesday, Sept. 18th.
Housatonic, at *Great Barrington*,	Wednesday, Sept. 26th.
Norfolk, at *Dedham*,	Thursday, Sept. 27th.
Bristol, at *Taunton*,	Tuesday, Oct. 2d.
Plymouth, at *Bridgewater*,	Thursday, Sept. 27th.
Barnstable, at *Barnstable*,	Tuesday, Oct. 9.
Nantucket, at *Nantucket*,	Tuesday, Sept. 25th.
Martha's Vineyard, at *West Tisbury*,	Tuesday, Oct. 16th.

AGRICULTURE OF MASSACHUSETTS.

FARMS.

MIDDLESEX NORTH.

From the Report of the Committee.

Whatever has been the cause, it is well known that within a few years past the offering of *Farm Premiums* has been discontinued by many of our county agricultural societies.

This, as it appears to me, has been a great mistake. The effect of these premiums upon the farming interests, as a general rule, I believe to have been highly satisfactory. Without detracting at all from the merits to which others may be entitled, I would here say that at least *two* of the farms to which have been awarded premiums by the Old Middlesex Society, and which have come under my own observation particularly, have held their position in the first rank to the present time. I refer to the farm of the late Amos Carlton, of Chelmsford, and that of Mr. Ephraim P. Spalding, president of this society. That the proprietors of these two places were stimulated in their efforts to make improvements, and that they attributed their success, in some degree, to the increased interest felt, and extra exertion made, while in the field as competitors for these premiums, there can be no question.

During the winter of 1863–4, Mr. Spalding—to whom I have just referred—with a desire to advance the interests of the younger portion of farmers in this community, tendered to this society, through its secretary, the sum of *forty dollars*, to be awarded as premiums to farmers under thirty years of age, residing in this district. The donor was, without doubt, actuated by the feeling that some encouragement to this class of farmers was needed; and his own experience in this matter had convinced him of the importance and value of keeping, so far as practicable, strict farm accounts. The society accordingly offered the following premiums:—One of twenty dollars, one of twelve, and one of eight, to be paid in the fall of 1865. For these premiums one person only—Mr. Darwin P. Keyes, of Dunstable—entered his name as a competifor. This want of competition your Committee deeply regretted, inasmuch as it necessarily detracts from the interest felt by all parties.

They visited the farm of Mr. Keyes in the month of September, 1864, and one member of the Committee—Mr. French, who resides in the same town—has visited it on various other occasions, and has made himself familiar with the methods adopted by the proprietor in its management.

The farm contains about one hundred and eighty-five acres, forty of which are wood and sprout land. There are also several acres of wet or brook meadow, yielding a good supply of fair stock hay. Mr. Keyes, on taking charge of the farm, some three or four years since, turned his attention to stock raising; and at the time of your Committee's visit had upon his place twelve yearlings, (steers and heifers,) and eight calves. These were in good condition, and gave evidence of careful management on the part of the proprietor. A continued attention to this important branch of farming business could not have failed of being highly remunerative at the present ruling prices of farm stock. On the place was found a good substantially-built barn, well filled with hay and grain, while the cellar under the same was apparently kept well supplied with meadow-muck or loam for composting.

The appearance of the cultivated crops—consisting principally of corn and potatoes—was good, although the severe drought of the season had affected a portion of the land considerably. Most of the land under cultivation had, as we were informed, been used for many years as pasturing, and was somewhat stony and much grown to bushes. To reclaim this was a primary object in the cultivation.

For further particulars in relation to the crops I would refer to the Farm Accounts, as presented by Mr. K., for the seasons of 1864–5.

The value of the farm stock, May 1st, 1864, as appears from those accounts, was estimated at one thousand and twelve dollars. To this should have been added the valuation of the farm, (including buildings,) farming implements, &c., and on these interest should have been charged before striking the yearly balance. On the other hand, any permanent improvements made either to the land, fences or buildings, should be accredited in the account, the same as additions made to stock or tools. This, Mr. Keyes has, in a measure, failed to do, and I call attention to the fact as one of great importance to any one attempting to keep accurate or satisfactory farm accounts. In Flint's Agricultural Report for 1863 may be found a well written and valuable essay upon the subject of Farm Accounts, by John A. Bourne, of Marshfield. In this essay Mr. Bourne has given a plan for keeping these accounts, and has also thrown out many useful hints which it would be well for every farmer to adopt. While the accounts rendered by Mr. Keyes were not entirely satisfactory to the Committee, they serve to show very nearly the results of his farming operations during the period they cover. The accompanying statement will also show very clearly that Mr. K. has taken hold of his work *earnestly*, and, like many of his brother farmers of Dunstable, intends to let his *works speak his praise.*

In concluding this report, I must call attention to one important subject pertaining to domestic economy, and which, at the time of your Committee's visit, in '64, appeared to have been neglected. The importance of securing a suitable helpmeet in order to insure the conduct of agricultural pursuits to a successful *issue*, will, I doubt not, commend itself to the good sense of Mr. Keyes, to whom the Committee have awarded the first premium of $20.

Statement of D. P. Keyes.

In connection with the farm account which I have kept for the past two seasons, and which I now furnish for your examination, I present the following statement of my proceedings. I commenced the account proper May 1st, 1864, although I charged the farm with all paid out for labor after April 1st. I planted about four and one-half acres with corn, potatoes, beans, &c. Three acres of this ground were in pasturing that had not been ploughed for about twenty-five years. Part of it was quite rocky, and there was some brush upon it. My object in ploughing and planting it was to convert it into mowing. The other acre and a half had been mowed for twenty or more years successively, without manure. On one acre and one-half I spread fifty loads of stable manure, and ploughed under the furrow, and dunged in the hill with fifteen loads of manure from a hog-pen. The rest of the planting ground was manured lightly in the hill only. In all, I used ninety-five ox-cart loads of manure. I sowed about two acres that were planted the previous year with oats and grass seed. The drought of summer injured my crops very much, especially corn and oats. Before planting, I removed the rocks from a field of about five acres that was seeded to grass the year before, and also cleared about six acres of rock heaps where they averaged about a heap of four to six bushels of small stones to the square rod. This enabled me to mow with a machine about twenty-five acres. In June, I broke up a piece of about three acres of exhausted pasturing that had not been ploughed for about forty-five years, and sowed it with buckwheat. My purpose was to rot the sod, then manure and plant, and re-seed for pasturing. My crops were about as follows: Oats, thirty-one bushels; potatoes, one hundred and seventy-six bushels; corn, one hundred and forty-six bushel baskets of ears; buckwheat, twenty-seven and one-half bushels; apples of all kinds, about three hundred bushels. I would here say, I dislike "estimates." I know the value of these apples to a *cent*, but as they were marketed at different times and in different ways, I cannot tell within five bushels the exact quantity. I had also about twenty dollars' worth of peaches, two cartloads of pumpkins, three hundred and fifty pounds Hubbard squashes, and a fine lot of melons and garden vegetables. A milk route was started in our neighborhood July 1st, and to accommodate myself to the new order of things, I commenced exchanging my young stock for cows, as I wished to help sustain the route and make selling milk a business. Aside from this consideration, I think my profits would have been larger to have kept my young stock another year. My account will show what disposal was made of the crops. I preferred, as far as practicable, to market them by feeding my cows.

This present year, 1865, I have cultivated the same ground I did last year, with the addition of about half an acre of tough ground, well covered with brush and filled with stones, some loose and some tight. On the part planted last year, I spread one hundred and six loads of manure and ploughed it in. Put no manure in the hill. The tough part was wet and could not be planted till late. As it was then planted all around it, I did not try to put on manure, but put plaster in the hill and planted with potatoes. I got but few potatoes from this, but the ground is now well rotted and in good state for cultivation. The ground planted last year has produced a fair yield of corn—a part of it very good—and a few potatoes. Potatoes have done poorly with me this season. From fourteen and a quarter bushels planted, I have harvested but eighty-two bushels. On the ground where I had buckwheat last year, I planted corn, potatoes, beans, pumpkins, squashes, &c., in variety. I put a little plaster in the hill for corn, spreading manure at the rate of eighteen loads per acre. This was done after all my other planting, and in June. The crop, as I expected, was very light, but the land is improved somewhat. I have used, in all ways, for farm and garden, one hundred and sixty-six ox-cart loads of manure this season. I have never bought manure or fertilizers of any kind, except plaster, which works well on part of my land. I practice stabling cows every night the year round, and as the manure drops in the barn cellar, mix with it from time to time loam or sand and muck. I cannot give you the amount of corn of this year's crop, as it is not all husked, but shall probably have three hundred bushels of ears. Had about forty bushels of apples of all kinds. There is now upon the farm a stock as follows: Two horses, one pair of three-year old stags, eleven cows, four yearlings and a calf. If I do not increase the stock, I judge I have keeping for them and about eight tons of hay to spare. I have built, last season and this, about sixteen rods of heavy wall, mostly with stone taken from the fields I planted. I have also cut and cleared from one field quite a lot of brush. The ground I have planted two years, I intend to lay down to grass next season. I sowed about two and one-half acres of dry, sandy land with buckwheat. The dry weather injured it very much. The crop amounted to twenty-three and one-half bushels. Had I not felt anxious to turn a piece of pasturing into mowing as quickly as possible, I should not have planted so many acres. I think it poor policy, generally, to try to cultivate more ground than can be well manured. My farm consists of one hundred and eighty-five acres and fifty-eight rods of land, of which about forty acres is wood and timber, sprout land or brush; the remainder is suitably divided into mowing, tillage and pasture. You see, by my account, I have made but little over expenses since May 1st. For the six months to come, I shall probably earn as much by chopping or teaming as my outgoes will be, except for grain. I expect to feed what corn I have raised, and have bought three tons of shorts, at twenty-seven dollars per ton. If I keep cows to eat all my hay, my milk will probably return me four hundred dollars for the next six months. If I do not make so much milk, I shall probably sell considerable hay. D. P. Keyes.

P. S. I have under-estimated one item. I can make from three hundred and fifty to four hundred dollars' worth of milk, besides selling eight or ten tons of hay, if I feed all my grain.

The foregoing is respectfully submitted for the Committee.

E. H. Warren, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

The Committee on Farms report that after several years without an entry, one farm, which took the first premium in 1855, was again entered this year for the same purpose. The rule which required a particular financial statement of the yearly operations, it was supposed, prevented many persons from competing who would otherwise have done so. Many, and in fact the generality of farmers, are not in the habit of keeping an exact record of transactions, even where money is concerned, so that it is impossible for them to know, at the year's end, whether their prosperity is plus or minus. Some who do, although good farmers, are unable to show a balance sheet that they feel proud of. There are still others, who, though they can demonstrate to themselves a very satisfactory state of affairs, yet have a modest repugnance to telling the world of it, even under the temptation of a premium. Under these circumstances the present board of trustees abolished the requirement of a financial statement, hoping, by this means, to get a specimen of farm operations worthy of record for the public benefit.

The question here suggests itself, What is the object to be attained through the offer of premiums by agricultural societies? The Commonwealth gives to each of the various agricultural societies within its limits a sum not exceeding six hundred dollars annually, to be offered in premiums for various objects. Why is this done, and what is to be gained by it? In general terms, we may say that it is given for the promotion of agriculture and the mechanic arts, by the collection and diffusion of agricultural and mechanical information. The Worcester North Society, receiving six hundred dollars of this bounty, evidently has a duty to perform. It ought to show to the State that its money has been well expended, and has elicited its quota of information. This can only be shown in its public record or printed report. If a society makes no report, the inference is that it has nothing worth saying, and it becomes a question whether or not it deserves its bounty. If the report is a bare statement of the awards, it has no value except to the directly interested parties. This meagerness of the annual report, or the entire want of it, may be in part the fault of the society as such, but is more likely to be due to the failure of the different committees.

Each committee has intrusted to it a portion of the State's bounty to be awarded to deserving competitors, and is to that extent responsible to the society for its expenditure. We think it the duty of every committee, where the case will admit of it, to give a reason for their decision. Of what value is it to the community to know that Mr. Smith's cow received the first premium? What is gained by the decision? Mr. Smith gets the money, and the committee gain what information they can, by seeing the animal and hearing Smith's statement. Now, if the members of the committee are to be the only gainers in the way of knowledge, it would be best to make our committees very much larger than we do. We look upon the committees rather as almoners of the State's bounty on the one hand, and Smith's experience on the other. If they award money or other property, they should be able to, and should, show for just what it was awarded, and give the reasons therefor. In many cases this, of course, would be unnecessary or even impracticable; but where there are palpable reasons for the decision of a committee that would be of interest to the public, the committee ought, we think, to give them in connection with their award.

The only farm entered for our examination was that of Mr. Abel F. Adams, of Fitchburg. We award him the first premium of $15. Now, suppose we make no further remark. Mr. Adams gets the $15, and that is all there is to it, except that the fact becomes public, and people know where a premium farm is, which they can visit if they please. The difficulty, however, is that scarcely anybody pleases. Mr. Adams, in this dilemma, volunteers a statement, which accompanies this report. Although well enough, as far as it goes, it gives but a faint idea of what he has done and is doing, as it appeared to us. A great many statements, reading as well as that, might be made of farms all about us, not one of which would deserve a premium; and therefore we feel that something additional should be said to make the case a little clearer.

We may safely say, that with Mr. Adams farming has been one-sided and up-hill business. One-sided, because, on a hundred-acre farm, his buildings are placed at the extreme end of its longest diameter. Up-hill, for the reason that, although compact, its altitude varies, as near as we could judge, about two hundred feet. The greatest variation is across its shortest diameter. His system of roads is such that these natural obstacles of elevation are in part overcome. They run lengthwise of the farm, in nearly parallel lines, so that most of his roadway has but small grade to overcome. The greater part of the whole area has a north-easterly slope, and its clean and well-kept surface affords the writer, on an opposite rise, a perpetual feast for the eye. The surface is divided into fields of four to six acres or more by substantial stone walls, which must have required, in the aggregate, a very great amount of labor in their construction. We believe that very many interior walls on our farms might be dispensed with at a profit. In Mr. Adams' mode of farming they are perhaps necessary, as all portions of his farm are used alternately for tillage, mowing and pasture. His walls were all built of the stones lying on and in the soil, and that used to be considered the best way of getting rid of them. Having built all the wall he desires, Mr. Adams, some years ago, established a stone "depot" in a favorable location, where he has deposited, literally, thousands of loads of stone, the product, mainly, of his manner of ploughing.

Mr. Adams' forte lies in the manufacture of soil, so to speak. An unproductive spot is a continual eyesore to him. If he discovers anything of the kind on any one of his acres, he straightway leaves the ninety and nine and devotes himself to the barren fraction until it becomes fitted for the companionship of its associates, and worthy of its owner. So far does he carry this passion, that he has actually dug out the bottom of a pond, and then what lay below it, all for the purpose of rendering the tops of ledges, whereon it was spread, productive. In so doing he has obtained satisfactory success, but we cannot help thinking, at too great a cost. We do not believe that the end quite justifies the means. It might be for his interest if his limits could be circumscribed, and the barren spots left out in the cold, only that his occupation would be gone. We like his method of thoroughly doing whatever he undertakes. There are no bushes, briars or weeds allowed to grow near to or in the corners of his walls, but everything is kept clean. He believes such crops to be unprofitable, inasmuch as they are expensive to raise, and bring but a poor price in the market.

We consider it great praise to be able to say of this farm, that we could find nothing from first to last that we should be ashamed to exhibit if we owned it. There are very few farms of that kind. The greatest want that we discovered was that of a good mowing machine. Mr. Adams has not had encouraging success in consequence of using poor machines, and has come to speak with satisfaction of his mowers upon legs, that are always in order. We believe, however, that no man growing twenty or more acres of grass can afford, for a single season, in these times, to cut his grass by hand. To say nothing of the increased cost, the deterioration in value of the grass, consequent upon its standing a few days, and in some cases weeks, after the moment of its greatest value arrives, would sometimes pay for a machine in one hay season.

The buildings are well arranged, with facilities for conveniently carrying on the ordinary operations, with a good cellar under the barn for saving manure. Water was in plentiful supply to the buildings and pastures during the whole of the past very dry season.

In conversation with Mr. Adams, we inquired of him if he thought that he could have commenced life as a mechanic, placing his small capital at interest, and been in equally good circumstances as he is at the present time. He was decidedly of the opinion that he could not have done it, and brought up and cared for his family equally well. He ran in debt for his farm, and then, instead of devoting his whole energies toward immediately paying it off, by skinning his farm, he had the foresight to purchase manure, thus getting still farther into debt, all the time believing that in the end he could pay it all the easier.

Here is where many an ambitious young farmer fails. They make themselves slaves to the nightmare of a debt, imagining that until it is paid they can do nothing for the farm or themselves. A small debt to an intelligent and energetic farmer is not worth the loss of a night's sleep, while the opposite class, who ought to be frightened by it, sleep on notwithstanding. Many people have no faith in their own farming, as is evidenced by the fact of their not investing any of their surplus earnings in the business. If a farmer invests his money in corporative stocks that pay but six per cent. dividends, it is simply a confession that that is the best use he can make of it, or, in other words, he does not understand sufficiently his own pursuit, or has not confidence enough in it, to expect a return of six per cent. for his outlays. Such people, we think, should leave farming for something else that offers greater inducements to them. When a farmer runs in debt intelligently, it shows that he has faith at least in his ability to get more than the legal rate of interest through the use of his borrowed money ; and as long as he is satisfied that he does so, he need have no fears of his ability to pay in the end.

Your Committee can but express the wish that there were more farmers who had this faith, which they made their governing principle of action, in which case the Committee on Farms would have their labors increased, and such men as Mr. Adams might not always succeed in obtaining the first premium.

For the Committee,

JABEZ FISHER, *Chairman.*

Statement of A. F. Adams.

A portion of the farm which I offer for your inspection received a premium in 1855. Since that time I have sold land to the amount of $1,000, and purchased three acres, paying $200 for it. Feeling desirous to keep up the fertility of my farm, I have been engaged most of the time in the manufacture and sale of milk, consequently consuming most of my hay and grain upon the farm. From April 1, 1856, to April 1, 1865, (the time when I make up my farm account,) I have sold milk amounting to ten thousand seven hundred and ten dollars, ($10,710.) My sales of other articles from my farm, with the exception of cattle and beef, have amounted to about $500 annually, and, owing to the size of my family, I have had a very large home market.

I have usually hired two men for eight months, and one man from three to five months, or nearly that amount of labor by the day, and generally one man in the winter. Much of this labor has been employed in making permanent improvements on the farm. I have continued the practice of following the plough with the iron bar and lever, until most of my fields are pretty thoroughly cleared of stones, some of my heaviest crops being raised where the most stones have been removed.

I cannot boast of extraordinary crops. I have been more anxious to make two spears of grass grow where but one grew before, or to raise some crop where nothing grew before, than to apply all my manure upon one acre for the purpose of obtaining a premium crop. I have ploughed most of my pasture, manuring and cultivating, raising respectable crops, and on such land am seldom troubled with worms or weeds. For stock, I prefer a cross with the Shorthorn. They come to maturity early, are good milkers, and, I think, will make more beef, at the same expense, than any other breed with which I am acquainted. They require good keeping, but I wait to see the man who has made himself rich by starving animals of any breed. If my statement is not sufficiently full, I would be happy to answer any questions proposed by the Committee.

Abel F. Adams.

PLYMOUTH.

From the Report of the Committee.

The first question with every thoughtful farmer, in attempting any experiment for the improvement of his land, his buildings or his stock, generally is, and certainly always ought to be, "Will it pay?" It is doubtless the object of the society, in offering premiums for the best cultivated farms, to induce their owners to obtain a solution of this question. The only way to accomplish this, is the constant practice of keeping accurate account of all the work of the farm. In all other departments of industry, the cost of every product must be known; in agriculture only is this all-important consideration neglected. This negligence is not confined to a few; it is the almost universal habit of the farmers of our county, so that those who know the cost of their crops are the very rare exceptions in their class.

If a wealthy man wishes to invest his money in a farm as a source of profit, and prudently desires the statistics necessary to determine whether he may expect six per cent. or ten per cent. profit on his outlay, where can he obtain the information? Certainly, he would hardly find such facts as would satisfy a man of experience in any common business. This could not have been the case, if the farmers, in large numbers, had conducted their labors on common business principles for the last fifty years. Instead of the agriculture which now prevails, we should have had, if not a science, at least a trustworthy art whose results might have been calculated with certainty. But it is gratifying to know that we are improving; that the number of those who pay attention to their farm accounts is slowly increasing, and that this progress is mainly due to the premiums of various kinds offered by the society.

There is another indication of improvement observable throughout our county, in the very general desire to possess, so far as practical, all the labor-saving implements offered in the market. If any new article makes its appearance, there is no difficulty in obtaining for it a fair trial, and its reception will depend upon its excellence. If the same freedom from prejudice prevailed in every department of agriculture, our progress would be as rapid as could be desired.

On the subject of stock, our farmers do not seem to judge so fairly, being disposed to reject the new, and to adhere to the old, because it is old. Improved horses, cattle and sheep are very scarce in our county, and the business of the farmers suffers accordingly.

We need more information in reference to the best method of manuring the lands. If a thorough conviction of the necessity of enriching all land from which a crop is expected, could get possession of the minds of farmers, they would avail themselves of every means of accomplishing this object. The refuse of the kitchen, the contents of the cess-pool, leaves from the forest and peat from the bog, would increase the pile of manure in the farmyard and give fertility to the thin soil of our county.

We need more reading of trustworthy agricultural books and agricultural papers; the establishment of farmers' clubs in every community, where all subjects pertaining to the profession may be discussed, and all minds aroused to more thought. Our confused and uncertain knowledge should be reduced to order, so that our farming may become truly a science, which means nothing more than knowledge verified by ample experience, and reduced to systematic form, so that it may be comprehended by every one having a fair share of industry and intelligence.

During the past three years, the Committee have visited annually the two farms entered for the society's premiums; one of these farms being owned by Mr. Austin J. Roberts, of Lakeville, the other by Mr. Albert G. Pratt, of Middleborough.

Both farms are large, well furnished with stock, implements and convenient buildings. The barns are well built, and large enough to contain all the products, to afford comfortable quarters for all the live stock, and ample room for the tools and machinery. The barn cellars are all that could be wished for the preparation and storage of manure, and the yards attached are commodious for the cattle.

The houses are large and elegant buildings, occupying beautiful sites, and surrounded by ornamental grounds, which give to these residences an air of comfort and refinement.

It is the opinion of the Committee, that Mr. Roberts has, during the three years he has been competing for the premiums on farms, shown remarkable energy in conducting his business, in making many judicious improvements, in increasing the fertility of his land, and in keeping an accurate account of every transaction on the farm. The Committee award to him the first premium of one hundred dollars.

Mr. Pratt has been very industrious, has worked his farm to its utmost capacity, and with the strictest economy, but he has not made very much improvement, and it is doubted whether he has added much to the fertility of his soil. The second premium, of seventy-five dollars, has been thought to be due to him.

CHARLES BURTON, *Chairman.*

Statement of A. G. Pratt.

This being my last statement as a competitor for premiums "for the most judiciously cultivated farm," I wish to state that my main object has been, through the years specified, to make my farm produce the most I could, (without detriment,) *of the staple articles of life.* The luxuries I have not lost sight of. Still, in my mind, they are secondary, and I have managed accordingly.

My apple crop proved a failure the past season, this not being the bearing year with my orchards, which has made a sad inroad into my income for the past year. I am more fully convinced of the advantages to be derived from sheep raising, whatever the breed may be. I have seen the good effects on my rye and potato crop, ground having been exhausted by previous cropping, by pasturing forty sheep for four years, producing abundantly, the mutton and wool paying a profit besides. I have my rye in the ground by the middle of September. I sow one bushel to the acre. I have used on my potatoes ashes mixed with plaster and salt, equal parts of ashes and plaster; one peck of salt to one barrel of the mixture, and plant without manure. This I have used on my sheep pasture. As a trial between putting manure in the hill and spreading, I prefer the latter, using ten to twelve ox-loads to the acre. Five bushels of seed to the acre; hills three and one-half feet each way.

I am satisfied that farmers in general seed too much. My corn crop has been a fair one, but the dry weather showed its effects in filling out. My wheat crop has not yielded as much to the acre as some years, owing to dry weather; yet the wheat was of extra quality. My mode of culture has been by taking a good soil, having been cultivated the previous year with corn or potatoes, ploughing and harrowing thoroughly. Soaking the seed twenty-four hours in strong brine, using ashes or slacked lime on it to separate the seed; two bushels of seed to the acre, using no manure, as it brings too many weeds with the wheat. I have used two to three hundred pounds of guano to the acre with good success. Should recommend doing so, if the price of guano would warrant it.

In my statement, rendered with this, I have been explicit in all details that I deem it necessary to report. I have charged myself with interest on the farm, as I think it my duty to do so. The following is my account of crops and expenses for 1865:—

Lot No. 1.—*Orchard.*—(2 acres, 17 rods.)

Expenses:		
2 bushels pears,	———	
Income:		
2 bushels pears, at $2,	———	$4 00

Lot No. 2.—*Barn Lot.*—(2 acres, 13 rods.)

Expenses:		
Securing $2\frac{1}{2}$ tons hay, at $5 per ton,	$12 50	
Labor on garden,	12 00	
Manure, 10 loads, at 50c,	5 00	
		$29 50
Income:		
$2\frac{1}{2}$ tons English hay, at $20,	$50 00	
Vegetables,	20 00	
		$70 00

Lot No. 3.—*Neck Lot.*—(17 acres.)

Expenses:		
Securing 8 tons English hay, $5 per ton,	$40 00	
Securing 3 tons meadow hay, at $5 per ton,	15 00	
Spreading manure,	2 00	
Ploughing 4 acres for corn,	8 00	
Manure, 40 loads, at 50c.,	20 00	
Planting the same,	6 00	
Horse and hand hoeing,	14 00	
Harvesting,	20 00	
Cutting stocks,	6 00	
		$131 00

Income:

8 tons English hay, at $20 per ton,	$160 00	
3 tons meadow hay, at $11 per ton,	33 00	
132 bushels corn, $1.05,	138 60	
Stalks and butts, at $9 per acre, 4 acres,	36 00	
		$367 60

Lot No. 4.—*Meadow Lot.*—(6 acres, 4 rods.)

Expenses:

Securing 4 tons meadow hay, at $4 per ton,	$16 00	
		$16 00

Income:

4 tons meadow hay, at $12½ per ton,	$50 00	
		$50 00

Lot No. 5.—*Rye and Grass.*—(7 acres, 3 rods.)

Expenses:

Securing 2 tons hay, at $5 per ton,	$10 00	
Securing rye, &c., 2 acres,	4 00	
Ploughing and getting in,	4 00	
Seed,	2 00	
Securing and threshing oats,	4 00	
		$24 00

Income:

23 bushels oats,	$16 25	
Straw,	4 75	
12 bushels rye, at $1¼,	15 00	
1,200 pounds straw,	7 00	
2 tons English hay, at $20,	40 00	
		$83 00

Lot No 6.—*Shaw Neck Lot.*—(19 acres, 26 rods.)

Expenses:

Ploughing 6 acres for potatoes,	$12 00	
Digging the same on lot,	34 12	
Hoeing the same,	20 00	
Manure, 60 loads, at 58c.,	30 00	
Repairing fences, &c.,	4 00	
		$100 12

Income:

570 bushels potatoes, at 60c. per bushel,	$342 00	

Pasturing 50 sheep,	$12 00	
		$354 00

Lot No. 7.—*Wood Lot.*—(12 acres.)

Expenses:		
Repairing fence,	$3 00	
		$3 00
Income:		
15 cords of wood, at $3 per cord standing,	$45 00	
		$45 00

Lot No. 8.—*Turnips and Beans.*—(9 acres, 105 rods.)

Expenses:		
Ploughing for both,	$1 50	
Cultivating and hoeing 1-2 acre of turnips,	5 00	
Marketing same,	8 00	
Hoeing and planting beans,	5 00	
Manure for lot, 20 loads, at 50c. per load,	10 00	
		$29 50
Income:		
Turnips, early, sold,	$50 00	
6 bushels beans, at $2½,	15 00	
Pasturing 3 cows, at $7 per head,	21 00	
		$86 00

Lot No. 9.—*Pasture.*—(6 acres, 97 rods.)

Expenses:		
Fencing the same,	$1 00	
		$1 00
Income:		
Pasturing one cow,	$7 00	
		$7 00

Lot No. 10.—*Orchard.*—(2 acres, 36 rods.)

Expenses:		
Securing 1 ton hay,	$5 00	
Fencing,	1 00	
		$6 00
Income:		
1 ton hay,	$20 00	
		$20 00

Lot No. 11.—*Wheat Field.*—(7 acres, 101 rods.)

Expenses :		
Ploughing wheat ground, 3 1-2 acres,	$7 50	
Seed, 6 bushels, at $2½,	15 00	
Sowing and getting in,	5 00	
Securing and threshing,	10 00	
Securing 4 tons hay, at $5 per ton,	20 00	
		$57 50
Income :		
40 bushels wheat, at $2½ per bushel,	$100 00	
3 tons straw,	30 00	
4 tons hay, English,	80 00	
		$210 00

Lot No. 12.—*Mowing Lot.*—(4 acres, 22 rods.)

Expenses :		
Securing 5 tons fresh hay,	$25 00	
Securing 1 ton bank hay,	5 00	
		$30 00
Income :		
5 tons fresh hay, at 11,	$55 00	
1 ton bank hay,	15 00	
		$70 00

Lot No. 13.—*Rye Field.*—(15 acres, 30 rods.)

Expenses :		
Ploughing 12 acres of rye ground, at $2,	$24 00	
Seed, 12 bushels, at $1¼,	15 00	
Getting in same,	10 00	
Securing and threshing,	40 00	
		$89 00
Income :		
180 bushels rye, at $1¼ per bushel,	$225 00	
1 ton English hay,	15 00	
1 ton meadow hay,	10 00	
10 tons straw, at $10,	100 00	
		$350 00

Lot No. 14.—*Orchard.*—(1 acre, 10 rods.)

Expenses :		
Ploughing for potatoes,	$4 00	
Seed potatoes,	6 00	

Digging, ...	$5 00	
Cultivating and hoeing, ...	8 00	
Plaster and ashes, ...	4 00	
		$27 00

Income:

80 bushels potatoes, at 60c. per bushel, .	$48 00	
		$48 00

Lot No. 15.—*Mowing.*—(109 rods.)

Expenses:

Securing 1 ton hay, ...	$5 00	
		$5 00

Income:

1 ton hay, ...	$20 00	
		$20 00

Lot No. 16.—*Mowing.*—(1 acre, 16½ rods.)

Expenses:

Securing 1 ton hay, ...	$5 00	
		$5 00

Income:

1 ton hay, ...	$20 00	
		$20 00

Lot No. 17.—*Turnip Lot.*—(6 acres, 107 rods.)

Expenses:

Ploughing 1 acre turnip ground, . .	$2 50	
Seed, 1 pound, ...	1 00	
Preparing ground and sowing, . . .	4 60	
Harvesting turnips, ...	6 00	
Manure, 30 loads, at 50c. per load, . .	15 00	
Securing 4 tons hay, at $5 per ton, . .	20 00	
		$48 50

Income:

150 bush. French turnips, at 60c. per bush.,	$90 00	
4 tons English hay, at $20, . . .	80 00	
		$170 00

Lot No. 18.—*Orchard.*—(145 rods.)

Expenses:

Securing 1 ton hay, ...	$5 00	
Repairing fence, ...	1 00	
		$6 00

Income:		
1 ton hay,	$20 00	
		$20 00

Farm Stock.

Expenses:		
2 cows, 1 year, at $40,	$80 00	
1 cow, 6 months, at $40 per year,	20 00	
50 sheep and lambs,	80 00	
5 hogs, 7 mos.—1 old and 4 young,	80 00	
Fowls, sold and on hand,	40 00	
2 heifers,	34 00	
		$334 00
Income:		
200 pounds butter, at 35c.,	$70 00	
15 lambs, at $4,	60 00	
80 pounds wool, at 60c.,	48 00	
900 pounds pork, at 17c.,	153 00	
260 pounds chickens, at 18c.,	46 80	
Eggs sold,	30 00	
2 heifers raised,	75 00	
40 turkeys, at $2,	80 00	
		$562 80

Sundries.

Expenses:		
Taxes,	$58 00	
Interest on farm,	300 00	
		$358 00
Income:		
125 loads manure, at $1 per load,	$125 00	
40 loads spread seeding grass,	40 00	
40 loads compost in yard,	20 00	
		$185 00

Total income,	$2,742 40
Total expenses,	1,300 12
Net income,	$1,442 28

Albert G. Pratt.

North Middleborough, Nov. 22, 1865.

Statement of Austin J. Roberts.

In making my last annual statement, I wanted merely to remark that my attention has mainly been devoted to the extension of my orchards and the care of them, which has prevented me from raising large field crops.

My apple orchards have yielded their second large crop of fruit. The trees are in a most thrifty condition, and had not the season been very unpropitious, the yield would have been from 300 to 500 barrels. The "Sops of Wine" sold as high as $10 per barrel, and the first class Baldwins at $7.

The peach orchards have been extended by farther setting out 500 trees of "Hale's Early," covering five acres of land. The whole number of trees is now 1,800, occupying about 12 acres of ground.

Those trees first planted are now beginning to bear, and are growing rapidly. The varieties planted are confined to two or three sorts, and are the best market and most reliable kinds.

Pear Orchards.—The trees were cut down and grafted two years since, to the Bartletts, and hence the small yield of fruit.

Cranberries.—The acre set out with vines will be eventually covered. The vines are gradually extending, though the growth has been slow the past summer. The yield from the natural bogs has been good for the extent of land occupied.

Grape Vines.—From the success I have had on a small scale with a number of vines, my attention is now directed to setting out a vineyard of Concord vines. The soil and climate in the vicinity of our large ponds, or more properly lakes, seem to be as well adapted to their culture as the Kelley Island, or the lake region of New York, where, within a few years, 5,000 acres have been set out in vineyards, yielding a profit of from $300 to $500 to the acre.

Account of Crops, Expenses, &c., on Farm of A. J. Roberts.

Income :	
Apples, 100 barrels, chiefly Baldwins, ...	$600 00
Cider, 6 barrels, home manufacture, ...	46 00
Vinegar, 7 barrels, home manufacture, ...	54 00
Cranberries, 8½ barrels, ...	90 00
Peaches, ...	51 00

Pears,	$12 00
Melons,	30 00
Small fruits,	10 00
Corn, 150 bushels,	150 00
Fodder,	40 00
Potatoes, 150 bushels, at 85 cents,	127 50
Rye, 103 bushels, at $1.40,	144 20
Straw, 6 tons, at $10 per ton,	60 00
Hay, English and fresh, 23 tons,	490 00
Turnips, 50 bushels, at 50 cents,	25 00
Garden produce, sold and consumed,	105 00
Pork, 550 lbs. at 20 cents,	110 00
Sheep, (8, mostly young bucks, for sale,)	30 00
Poultry, eggs and chickens,	50 00
Dairy, 250 pounds of butter,	100 00
Milk used,	20 00
Manure on hand for 1866, not composted,	125 00
Cord wood and boards,	160 00
Total,	$2,630 16

Expenses:

Fruit,	$110 00
Corn and fodder,	90 00
Potatoes,	42 00
Rye,	90 00
Hay,	98 00
Turnips,	7 25
Garden produce,	44 62
Pork,	50 00
Sheep,	12 00
Poultry,	15 00
Dairy,	20 00
Manure,	25 00
Cord wood and boards,	40 00
Taxes, repairs of tools and buildings, shoeing horses employed on farm, &c.,	350 00
Total,	$993 87

Lot System for 1862.

[Additional to General Farm Report for the year.]

Lot.	ARTICLES GROWN, &c.	Value.	Expense.
No. 1	Hay, Vegetables, Fruit, ...	$47 38	$16 50
2	Fruit, Corn, ...	75 50	25 25
3	Hay, ...	70 00	18 50
4	Hay, ...	40 00	10 00
5	Hay, ...	20 00	6 00
6	Corn and Fodder, ...	75 00	39 75
7	Woodland, value of improvements, . .	24 00	2 00
8	Rye and Straw, ...	73 28	36 96
9	Pasture, ...	15 00	1 00
10	Fruit, ...	28 00	10 00
11	Pasture, ...	5 00	1 00
12	Hay, ...	48 00	8 25
13	Hay, Pasture, Turnips, Beans, . . .	94 50	32 42
14	Fruit, Potatoes, ...	138 67	65 66
15	Fruit, Oats, Corn, ...	140 00	73 39
16	Hay, ...	18 00	3 50
17	Hay, ...	16 00	3 00
18	Pasture, ...	18 00	2 00
19	Growth of wood and pasture, . . .	40 00	1 50
20	Island, (wood), ...	12 00	–

Further details will be found separate from the field system, in the annual reports for 1862, '63, '64. The value and expense of the pasturage, as also of the value of growth of wood lots, has been added in this account.

Lot System for 1863.

[Additional to General Farm Report for the year.]

Lot.	ARTICLES GROWN, &c.	Value.	Expense.
No. 1	Hay, Vegetables, Fruit, ...	$83 00	$19 00
2	Fruit, Corn, ...	40 00	13 00
3	Hay, ...	80 00	18 00
4	Hay, ...	50 00	12 50
5	Hay, Cranberries, ...	95 00	28 50
6	Potatoes, ...	120 00	39 00
7	Woodland, increased value, ...	20 00	2 50
8	Pasture, ...	12 75	2 75
9	Pasture, ...	12 00	3 00
10	Corn and Fodder, $158; 150 barrels Apples, $400; Cranberries, $15;	573 00	176 75
11	Pasture, ...	5 00	1 00
12	Hay, ...	52 00	13 00

Lot System for 1863—Continued.

Lot.	ARTICLES GROWN, &c.	Value.	Expenses.
No. 13	Hay, Pasture,	$74 00	$16 00
14	Apples, Beans, Turnips,	111 50	34 87
15	Fruit, Wheat, Hay,	199 00	64 00
16	Hay,	18 00	4 50
17	Hay, Cranberries,	30 50	9 50
18	Pasture,	20 00	2 50
19	Woodlot and Pasture,	40 00	3 00
20	Island,—growth of Wood,	12 00	–

Lot System for 1864.

[Additional to General Farm Report for the year.]

No. 1	Hay, Vegetables, Fruit,	$92 00	$34 00
2	Fruit, Corn,	38 00	12 50
3	Hay,	85 00	17 25
4	Hay,	60 00	12 00
5	Hay, Cranberries,	64 00	14 00
6	Corn, Tobacco,	320 00	128 00
7	Woodland,—increased growth,	20 00	2 75
8	Pasture,	12 00	2 00
9	Pasture,	12 00	2 00
10	Fruit, Potatoes, Turnips,	215 00	77 75
11	Pasture,	5 00	1 00
12	Hay,	58 00	11 75
13	Hay, Corn,	120 00	38 00
14	Apples, Corn, Vegetables,	65 75	24 00
15	Fruit, Hay,	162 00	49 00
16	Hay,	20 00	4 00
17	Hay, (fresh),	15 00	5 00
18	Rye and Straw,	94 00	30 00
19	Pasture and growth of Woodland,	40 00	3 00
20	Island,—increased value of Wood,	12 00	–

Lot System for 1865.

[Additional to General Report for the year.]

No. 1	2 acres, garden proper and meadow—Hay, Vegetables, Fruit,	$85 00	$26 00
2	¾ acre, pear orchard and intermediate peach trees—Fruit,	40 00	10 00
3	3½ acres, house lot and meadow—Hay,	87 00	14 00
4	1 acre, permanent meadow—Hay,	62 00	10 00
5	5 acres, fresh meadow, with Cranberries—Hay, Cranberries,	79 00	19 00
6	2 acres, young peach orchard—partly Potatoes,	75 00	25 00

Lot System for 1865—Continued.

Lot.	ARTICLES GROWN, &c.	Value.	Expenses.
No. 7	22 acres, growing woodland—Growth of Wood, ...	$48 00	$5 00
8	13 acres, sheep pasture—Value of Pasture, .	12 00	2 00
9	5 acres, young peach orchard—Corn, Potatoes, Turnips, ...	255 50	109 25
10	4½ acres, orchard—Fruit, ...	324 00	50 00
11	½ acre, calf lot—Pasture, ...	5 00	1 00
12	⅝ acre, Hay, ...	50 00	10 00
13	5 acres, 2 lots in one—Hay, Pasture, . .	64 00	13 00
14	3 acres, upper orchard, (fallow land)—Fruit,	180 00	35 00
15	3½ acres, lower orchard—Hay, Fruit, . .	327 00	62 00
16	1½ acres, field garden—Vegetables, Melons, &c., ...	110 00	31 62
17	10 acres, swamp—Hay, Cranberries, . .	60 00	14 00
18	9 acres, rye field—Rye, ...	188 75	70 00
19	65 acres, woodland and pasture—Cord Wood sold, Pasture, ...	119 00	20 00
20	Island—Increased growth of Wood, . .	22 00	–

AUSTIN J. ROBERTS.

LAKEVILLE, Mass., Dec. 1, 1865.

PLYMOUTH.

From the Report of the Supervisor.

The practice of seeking the greatest possible production, at the least possible cost, has impoverished the soil on thousands of acres of land in Massachusetts, and on tens of thousands of acres of the more fertile lands of other States. Here, the elements of fertility have been abstracted and "carried to mill;" elsewhere, they have been "carried to market." Where cultivation was easy, past generations have taken ever from the soil, giving little or nothing in return, leaving to their successors the almost hopeless task of restoring what their ignorance or cupidity destroyed. And this practice of our ancestors is not without imitations in the present generation. Men buy and *drive* land, as animals sometimes have been bought and driven, for the express purpose of being worn out; and measuring all things by the standard of dollars and cents, they claim that the operation is a profitable one. If it is profitable to get gain by robbing one's contemporaries, it may be so to rob one's successors; and it is nothing less than this to convert into stocks and bonds those properties of the soil which render it capable of furnishing subsistence for man and beast.

Were every holder of land to make haste to be rich by bartering its fruitfulness for money, the earth would, in time, become but a barren waste. True, such a result is not immediately possible, because of the absence of labor and the want of a market. But it will become possible at some day, perhaps not distant, and the tendencies of the times are far too manifestly in that direction. Even now, all available muscle, human and brute, all the appliances of mechanism, all the power of steam, aided and intensified by the restless activity of merchants, the ceaseless competition of railroad and navigation companies, and the far-reaching but possibly short-sighted schemes of boards of trade, are brought into requisition for gathering in and transporting abroad the life-sustaining capacity of the yet unexhausted soil of the Great West, to be exchanged for foreign merchandise, much of which is useless, some pernicious, and all of slight worth when compared with its cost in the present and the future. The uncivilized red man bartered his land for glass beads, scarlet cloth and brass kettles, and exulted in the possession of such priceless treasures. The enlightened white man exchanges his, (or what is practically the same, the constituents essential to its fertility,) for similar gewgaws, and he, too, exults in his stores of glittering wealth. Verily, wisdom is not always the handmaid of civilization.

Political economists are ever dinning our ears with diatribes on the evil results of sending abroad gold and silver in exchange for the means of aping foreign fashions. That the results are evil is indisputable. But to check this outgoing current of the precious metals, they too often only urge increased production and exportation of the great agricultural staples of the country, and they have sometimes deemed themselves public benefactors when aiding such productions by sustaining a system of compulsory labor, and when furnishing facilities for such transportation by multiplying railroads and steam-ships. And yet it would not be a wide departure from the truth to say that every bushel of grain, and every bale of cotton or hogshead of tobacco sent abroad, represents a diminished capacity in the soil for sustaining the dense population, which, but for such improvidence, might, in the future, find abundant subsistence within our borders; in other words, that by such production we are depriving the soil of its ability to support millions in the future, to increase the needless wealth of a few thousands who live in the present. If the destruction of the goose that laid the golden egg was not consummate wisdom, this is most egregious folly.

It is useless to say that diminished fertility need not necessarily follow increased production. We admit that it need not, and we claim that it should not. But that it does is undeniable, and hence the necessity for a radical change in our system of agriculture.

When the time comes, as come it will, if the present system is continued, that our once fertile soil shall prove incapable of sustaining its own population, the truth, now dimly discerned by few, will become apparent to all, that men armed with swords and spears are not the only men who ravage the earth, but that even ploughshares and pruning hooks may be made implements of spoil.

The spoliation system of farming has its adherents among Plymouth County farmers, some of whom profess to have no higher aim than to make their farms serve their purposes during their life or their occupancy. "Shall I not do what I will with mine own?" is their verbal or mental response to any suggestion that such a system is not only unprofitable to themselves, but an infraction of the rights of others.

The civil law, in most cases of limited tenancy, guards carefully against strip or waste by the tenant. But the possession of an absolute title to land is deemed sufficient to authorize strip, waste or destruction to any extent. And yet a title in fee simple gives at the best but a life estate to the holder, with a restricted power to direct its descent. Descend it must, either by or without his direction, to succeeding generations, whose claims for subsistence will be equally valid with his own. Possibly the functions of the law are sufficiently extended in protecting those who live in the present, without aiming at protection for those who are to live in the future. Certain it is that he who has no higher rule of action, in the treatment of his land, or his domestic animals, than merely to avoid the liabilities or penalties imposed by the civil or criminal law, is far from being a model farmer, or an exemplary citizen.

But it is said that when land is exhausted it may be left to grow to wood, and thus renovate itself. It argues but small knowledge of the ways and works of nature to believe that the stunted growth of pine or birch, which such land can only produce, and even *that* cut off and carried to market, can replace in the soil those constituents, vegetable and mineral, which are essential to its fertility, whose original accumulation was the result of ages of elemental strife, and of countless repetitions of the growth and decay of vegetable and animal existences.

> "Time was, ere England's griefs began,
> When every rood of ground maintained its man."

When, through ill management, land has become so completely exhausted as to be worthless for cultivation, it is doubtless advisable to allow, and even to promote upon it, as far as possible, the growth of wood, for the reason that it cannot be made useful in any other way. But no acres of land not now exhausted should ever be so treated as to become capable of producing a meagre growth of forest trees. If any farmer has more cleared land than he can use as land should be used, let him sell to his neighbor who has none; if unwilling or unable to do this, he can allow it to grow to wood, while yet it has some power to sustain vegetable life, with the certainty that it will, at least, "hold its own," and be of value to those who may hereafter have need of it.

Stock raising and stock feeding should have a more prominent place than they now have in Plymouth County farming. Keep stock, and your stock will keep your farms. This proposition involves no question as to the comparative merits of different classes of stock for different uses. It is not based on any real or imaginary superiority of Jerseys for the dairy, of Devons for the yoke, or of Shorthorns for the shambles. Keep Jerseys, Devons, Shorthorns, grades or natives, as shall seem to you best, but keep something. And not only keep stock, but increase it. Present appearances indicate that a long time must elapse before the supply of any of the products of a stock farm will equal the demand, and that, not only for present profit but for permanent improvement, every farmer should keep his stock well up to the capacity of his farm for sustaining it. Thus, and thus only, can he avoid the dilemma of either cultivating his land without manure, which is a grievous wrong, or of buying manure when the means of making it are within his reach, which is, at least, unwise. Thus only can he secure for himself a fair interest for his capital, reasonable remuneration for his labor, and ever improving condition of his land.

The fact that thirty-five bushels of wheat, forty-five bushels of rye, fifty bushels of barley and one hundred bushels of corn, per acre, have been raised in Plymouth County, shows conclusively that its soil is not wholly barren or unproductive, and that its many exhausted fields, its too scanty and ill fed stock, and its too often meagre crops, scarce worth the harvesting, are, in part, at least, due to other causes than its inherent sterility. For its generally unfavorable reputation as an agricultural county, a corrected public opinion will, in due time, arraign the improvidence or cupidity of its husbandmen, and dare

"To blame the culture, not the soil."

ALDEN S. BRADFORD, *Supervisor.*

RECLAIMED LANDS.

ESSEX.

Statement of Henry L. Moody, of the Burleigh Farm, Danvers.

The reclaimed waste land, which I offer for premium, consists of about fourteen acres, of a light, gravelly soil, thickly filled with stones of various sizes. Previous to being broken up, it was used as a pasture, until it became covered with wood-wax and bushes, and of course, worthless for pasture.

When I came to the farm, April 1st, 1864, seven of the fourteen acres had been ploughed. Three acres had been planted with potatoes, corn and fodder corn; the remainder had been harrowed and left without planting.

My first work was to take off the loose stones; then I ploughed and planted the whole seven acres with potatoes, after manuring with half a shovelful to the hill, of cow manure from the barn cellar.

The potatoes were dug about the first of August following, and two hundred bushels were put into our cellar, and the balance of the crop was sold in the Boston market for something over six hundred dollars. In September of the same year, I commenced to break up the other seven acres, with a team of six oxen and five men, at the rate of about one-third of an acre per day, till all was completed. I then harrowed it with a heavy, long tooth harrow, using four oxen to draw it, turning up as many stones as possible. I then proceeded to dig out with bars, the large, and pick and put in heaps the loose stones, there being a large quantity ready to haul off in winter. After the snow fell, I commenced hauling them off on a large drag, made for the purpose. The largest of the rocks built thirty rods of wall on one side of the land, besides many loads which were taken by Mr. Merrill, and the remainder were hauled off and dumped in piles.

The land being now (1865) in good order for spring work, the fourth day of April I commenced to cross-plough the whole piece, with four oxen and two men, at the rate of one acre per day, till completed. I then harrowed the same well with one pair of horses, then furrowed out, following with planting potatoes, eight and a half acres; corn, four and a half acres; turnips, one-half acre; cabbage, one-half acre;—total, fourteen acres. Potatoes and corn were manured in hill; cabbages and turnips in the drills, with manure made on the farm, composted with one-third muck. This piece of land was not *fully* manured, on account of being short of supply.

The crop looked very promising until the long and severe drought set in, which cut it short,—the potatoes, say one-half crop; corn, three-fourths do.; cabbages, almost a failure; turnips, one-half crop.

Cost of cultivation, with value of crop, of seven acres, in 1864:—

Picking and hauling off stones, ...	$50 00
Ploughing, ...	25 00
Harrowing, ...	4 00
Furrowing, ...	10 00

Manure for	$168 00	
Seed potatoes, at 75c. per bush. for	42 00	
Planting,	70 00	
Harvesting crop,	70 00	
		$439 00
Contra Cr. Total of value crop,		900 00
Total profit in 1864,		$461 00

Cost of cultivation of the 14 acres, with product, for 1865:—

Cost of breaking up seven acres,	$250 00	
Digging, picking and hauling of stones,	200 00	
Cross-ploughing fourteen acres,	140 00	
Harrowing, $6; furrowing, $8,	14 00	
Manure for whole,	450 00	
Seed potatoes for whole, at $1 per bushel,	68 00	
Seed corn,	2 00	
Seed cabbage and turnips,	1 75	
Planting whole,	140 00	
Harvesting whole,	135 00	
		$1,400 75
Contra Cr.:		
Sold and stored potatoes, valued at	$725 00	
Sold 66 barrels turnips at $2,	132 00	
Sold cabbage and kept for use,	35 50	
Corn, 275 bushels, cost $1 a bushel,	275 00	
Small corn and stover,	86 25	
Add profit in 1864, as above,	461 00	
		1,714 75
Net profit in two years,		$314 00

MIDDLESEX SOUTH.

From the Report of the Committee.

The Committee on improved Meadow and Swamp Land find that there were two premiums offered for the best experiments in reclaimed meadow or swamp land of not less than one acre. Entries were made by Messrs. Isaac V. and George Adams, of Hopkinton, in different parts of Little Cedar Swamp. One other entry was made from Southborough, but not coming within the rules of the society, it was not examined by the Committee.

As it appears by the statement of Isaac and George Adams, hereto annexed, Little Cedar Swamp, containing about 200 acres, was, before 1861, of but little value to the owners, being in so wet and miry a condition that what little hay grew upon it was hardly worth getting. In 1862 and 1863, by energy and perseverance, Deacon Isaac Adams and Deacon Moses Buck, much against the wishes of the rest of the owners, succeeded in getting commissioners appointed by the superior court to make such improvements as they deemed for the best interest of all the proprietors, and after a survey, finding a sufficient fall, opened a ditch the entire length of each side of the swamp, so that each individual owner connects his ditch with the main ditches, which leaves the meadow dry enough for a team to work upon.

The acre offered by Isaac V. Adams lay by the side of the swamp between the upland and main ditch, and was covered with gravel in a thorough and workmanlike manner. The Committee were unanimous in giving him the first premium of $10.

The acre offered by George Adams lies in the middle of the swamp, well drained by a ditch cut each side, connecting with the main ditch, burned over in 1864, and sowed with oats for fodder in June, 1865. The increase in value of this acre is estimated at $40. The Committee award him the second premium of $8.

WARREN WHITNEY, *Chairman.*

Statement of Isaac V. Adams.

I enter for premium one acre of improved meadow lying on the easterly side of Little Cedar Swamp which was drained by order of the superior court of the county of Middlesex in the years 1862 and '63.

The land was very wet previous to this time, and the hay hardly worth cutting. I valued the land at ten dollars per acre, and paid a tax of five dollars per acre to cover the expense of drainage. In the summer of 1863 I made a fruitless attempt to cultivate a small portion, perhaps one-fourth of an acre of that now entered for premium. I supposed ploughing was the first operation that was necessary to be performed, but my oxen could not go in the furrow without dropping into the mire, and I was obliged to resort to another course of procedure. I took a pair of wheels and chained the plough to the axletree, and by this means the oxen were enabled to travel on the grass, and could keep above ground at least a part of the time. In this way I succeeded in turning over about a quarter of an acre, and having hauled some compost on to a part of it I planted a few potatoes and a little corn. But although the potatoes came up they grew but little, and as the season advanced, excessive wet weather came on and the crop was nothing. A little corn was seen to struggle for a feeble existence for a little while, but was finally totally destroyed by the musk rats. I had commenced cultivation too soon. The drains had not yet carried away the surplus water, and the soil was not in condition to be worked.

But in the winter of 1863 to '64 I took the first step in the right direction. One hundred and seventy-five loads of gravel were carted from a hillside near by, and spread upon the surface at an expense of twelve and a-half cents per load. Previous to spreading the gravel I had spent one day in cutting off bogs, so that the surface was left level and unobstructed. In the spring of 1864 I spread nine loads of compost over about three-fourths of the piece, and having harrowed it well sowed four bushels of oats, six quarts of herdsgrass seed and five pounds of clover. In the autumn I harvested a ton and a half of oats for fodder, valued at $30 per ton. The cost of harvesting was four dollars.

In June, 1865, the grass was cut with a Kniffen mower, and was estimated at two tons on the acre; the part not sown with oats having been seeded down in autumn. The expense of mowing was $1.25, and the raking and carting, $2. There is now a crop of rowen on the piece estimated at fifteen hundred weight. Nothing has been expended for drainage except the tax of five dollars paid to the commissioners, who excavated nearly two miles of ditch in the meadow of which this is a part. The main ditch is eight feet wide at the top, and six at the bottom. Two other ditches, four feet in width, empty into this, and traverse the entire length of the meadow. As one of these ditches borders the piece entered for premium on one side, I have not found it necessary to make any cross ditches, the ground being perfectly dry, and hard enough for a team.

Expenses:

Original value of land,	$10 00
Tax for ditching,	5 00
Ploughing and planting in 1863,	5 00
3 loads compost,	3 00
Carting and spreading 175 loads gravel at 12½ cents,	21 87
9 loads compost,	9 00
4 bushels oats at 75 cents,	3 00
9 quarts herdsgrass,	65
5 pounds clover,	75
Harrowing in oats,	1 00
Harvesting,	4 00
3 loads compost, (autumn,)	3 00
Grass seed,	65
Cutting grass, 1865,	1 25
Raking and carting,	2 00
Total expense,	$70 17

Profits:

1864, 1½ tons oats,	$45 00
1865, 2 tons hay,	40 00
15 cwt. rowen,	15 00
Present value of land,	75 00
	$175 00
Deduct expenses,	70 17
Net profit,	$104 83

HOPKINTON, August 22, 1865.

Statement of George A. Adams.

The acre of reclaimed meadow which I enter for premium is a part of six acres of land purchased in 1861, at a cost of five dollars per acre. It is a part of Little Cedar Swamp, a tract of meadow land comprising two hundred acres situated in the east part of Hopkinton. Little Cedar Swamp was drained in 1862 and 1863 in accordance with the provisions of chapter one hundred and forty-eight of the General Statutes of Massachusetts. Previous to 1862, this meadow was so wet and soft as not to admit of driving a team upon it, and the little hay that grew upon it was for the most part removed upon poles, and in some cases it could not be cured upon the ground in consequence of standing water. The hay was of little value except for bedding, and some of the proprietors preferred to let it stand rather than incur the expense of securing it.

The superior court of Middlesex County appointed William F. Ellis and Elias Grout, of Ashland, and David Fisk, of Framingham, commissioners, to make such improvements in Little Cedar Swamp as they deemed for the best interests of the proprietors. These gentlemen having made a survey and adopted a plan of thorough drainage, opened about five hundred rods of ditch. They constructed a main channel eight feet wide at the top, six feet at the bottom and four feet deep. The other drains are four feet in width, and of depth adapted to grade. They extend the entire length of the meadow, a distance of one mile, and are so constructed that individual proprietors can connect cross ditches with them, and make such improvements upon their own premises as they think for their interest. The total expense of the improvements made by the commissioners was five hundred dollars, which sum was apportioned among the land holders in proportion to the benefit received. The tax upon the acre entered for premium was five dollars.

In 1864, this acre was burned in connection with a large tract adjoining at an expense of one dollar. A drain, three feet wide, was opened on each side, costing two shillings per rod by contract, but as this drain is equally advantageous to the adjoining land only one-half the expense is charged to this experiment. The piece was harrowed both ways June 3d, 1865, employing men and oxen one half-day. It was burned a second time June 6th and 7th, requiring the attention of one man about half the time. It was harrowed again June 10th. June 13th, it was sowed with three and one-half bushels of oats and seven quarts of herdsgrass seed. It was then harrowed and bushed. The oats were cut for fodder August 8th. There were four loads, estimated at twelve hundred pounds each.

The meadow is now so hard that a loaded cart can be driven over any part of it. All stumps, roots and fragments of wood, having been removed for fuel at a good profit, the surface is perfectly smooth and as well adapted to the use of the mower and horse-rake as a western prairie.

Expenses:	
1861, First cost of land, (1 acre,)	$5 00
1863, Commissioners' tax,	5 00
1864, First burning,	1 00
One-half expense of 40 rods ditch at $16\frac{2}{3}$ cents,	6 67
1865, Man and team $\frac{1}{2}$ day harrowing,	1 50
Second burning, 1 day labor,	1 50
Man and team $\frac{1}{3}$ day harrowing,	1 00
$3\frac{1}{2}$ bushels oats at 87 cents per bushel,	2 61
7 quarts grass seed,	1 30
$1\frac{1}{2}$ days' labor man and team, sowing, harrowing and bushing,	4 50
2 days' mowing and spreading oats,	3 00
2 days' raking and carting,	3 00
Total expense, including land,	$36 08
Profits:	
$2\frac{2}{5}$ tons of oats at $18,	$43 20
Present value of land,	50 00
	$93 20
Deduct expenses,	36 08
Net profit,	$57 12

ORCHARDS.

ESSEX.

CULTIVATION OF THE PEAR.

The Soil and its Preparation.

Pear trees require a deep and strong soil. Land with a clay or hard gravel subsoil is to be preferred. If the soil is heavy or without good natural drainage, it should be under-drained. This can be done by digging trenches three to four feet in depth, with proper inclinations, and filling to within eighteen inches of the surface with stones, over which may be placed a layer of leather or wood shavings, and the remainder of the trench filled with soil.

After providing proper drainage, the entire ground should be spaded to a depth of from eighteen inches to two feet, and the top soil thoroughly mixed with the subsoil. The importance of this can hardly be overestimated. It is essential for the growth and health of the trees in all seasons, and absolutely necessary for their protection in times of long-continued drought. The results in this vicinity the last two seasons afford the strongest proof of this. Trees planted in deep and well-prepared soil have been apparently but little affected by the severe droughts, whilst in soils even best adapted naturally for their growth, which had not been prepared by spading to a proper depth, the trees either prematurely lost their foliage, or the leaves withered and drooped, and the growth of the fruit was stopped.

Many people neglect this important preparation of the ground, on account of the expense which it requires. This is a great mistake. The cost of properly spading land to the requisite depth is from $100 to $150 per acre ; and, if a person who proposes to cultivate trees on a large scale is unable to afford the necessary expense at once, he will find it in the end far more profitable to prepare and plant with trees, such portion of his ground each year as he can afford to, properly. A few trees carefully planted in ground thus prepared will be more remunerative than a much larger number set in soil without preparation ; and when trees once get started in a deep soil, they are very sure to live and thrive, if properly protected and manured. Many have the impression that the life of the pear tree is more uncertain than that of any other tree suited to our soil and climate, even under the best care and culture. This impression is an erroneous one. Pear orchards can be seen in this vicinity, planted within the last ten or twenty years, in which not one tree in fifty has died.

Planting and Manuring.

Few trees require a more fertile soil than the pear. As the ground is being prepared it should be enriched, if possible, with well-composted manures, which should be incorporated with the soil near the surface. If the manure is not well rotted, and the trees are planted immediately after it has been put in the ground, there is danger of injury to the roots. If thoroughly composted manure cannot be obtained, it is better not to spade in any, but to plant the trees, and apply the manure liberally upon the surface afterwards.

The trees should be planted with great care, the roots placed in their natural positions, and the earth carefully packed about them. Trees upon the pear root should be planted at the same depth they stood in the nursery, but those upon the quince should be planted so deep that from two to three inches of the pear stock will be covered with earth. This will secure the trees against being disturbed by the winds, and will induce, in most instances, roots from the pear. Of several hundred trees upon the quince, planted five and six years ago, to which my attention has been especially directed, most have roots, some very large, from the pear stock.

Pear growers differ in opinion as to the best season for planting the trees. I have seen the best results from those planted in the autumn. They should be set as soon as possible after the ripening of their leaves, that they may get fairly imbedded in the earth before the ground freezes. If planted in the spring, they should be set as early as the frosts and the condition of the soil will permit; if possible, before the buds have commenced to push.

Pear trees should be manured annually, in the autumn, after they have lost their leaves. The manure operates as a mulch to prevent the injurious effects of freezing and thawing, and the mineral substances in it are washed by the rains of autumn and spring into the ground, and furnish nutriment to the trees in their first summer growth, which is of great importance. If the manure is applied late in the spring or in the summer, it tends to stimulate a late growth, which frequently does not ripen, and causes blight. A wheelbarrow load of good manure or compost should be placed around each young tree. If not well rotted, it will be well to draw earth around the trunk of the tree to prevent injury to the bark from the action of the manure.

Selection of Trees.

Particular attention should be paid to the health and vigor of the trees to be planted. If selected from a nursery, those trees only should be taken which have been planted a sufficient distance from others to allow the proper growth of the roots. The trees should be well shaped and of vigorous growth. *Never* *purchase a pear tree which did not make a good growth the preceding season.* This is a most important rule, but one rarely observed by purchasers of trees. Most people who have not had experience in the culture of pear trees select large trees, with but little regard to the time they have been growing, or to their health and vigor, as shown by their recent growth. If trees that made but little growth the past season are selected, the probability is that, with the best culture, they cannot be forced to a vigorous growth for years, if indeed they ever can be.

These directions are of the greatest importance to be observed, and of course require that trees should be carefully examined before they are purchased. Many persons contract with agents of nurseries at a distance for their trees, and leave to them the selection. If these agents, or their principals, are honest, and furnish from the average growth of the nurseries, a large portion will be unsuitable to plant, as in the best pear nurseries in this country a considerable portion of the trees are deficient in the requisites above stated; and if dishonest, as is not unfrequently the case, only refuse trees of stinted growth will be furnished, which will not be worth the trouble and expense of planting. Any one who desires good trees, that will grow and be productive, should carefully examine them before purchasing, or employ some suitable person to do it for him.

Trees on the pear root should have no limbs nearer than four or five feet to the ground. Those on the quince root should be trained with shoots from the stock as near the ground as possible, as it is desirable they should be grown in the pyramidal form, both for productiveness, and to prevent their being blown out of the ground by high winds.

Selection of Varieties.

Persons without experience in the cultivation of the pear, are perplexed by the large number of different varieties recommended in the books and by pear growers. Even men of large experience differ in opinion respecting some varieties, and it is also true that soil, position, and climate, materially affect the character of many kinds of this fruit. In selecting from the large list recommended, regard should be had to the character of the fruit, the time of ripening, that a succession of fruit may be obtained; and the productiveness, and health and vigor of the trees of the respective kinds.

The following varieties are recommended for garden cultivation in this county, regard being had to all the above conditions. They are enumerated in the order of the ripening of the fruit, and furnish a succession of pears from the early part of August to April.

Doyenné d'Eté, Beurré Giffard, Bartlett, Belle Lucrative, Louise Bonne d'Jersey, Seckel, Urbaniste, Beurré Bosc, Beurré d'Anjou, Lawrence, Winter Nelis, Vicar of Winkfield, Easter Beurré.

The *Doyenné d'Eté* ripens early in August, is a small but good early pear, and the tree healthy and productive. Does well on the quince.

The *Beurré Giffard* ripens about the middle of August. The fruit is of good size, handsome, and of excellent flavor. The tree grows slowly, and needs attention to train it in proper shape. This, like all slow growing trees, should, when practicable, be grafted into a vigorous stock. It grows well on the quince.

The *Bartlett* is too well known to need description. It is the most profitable pear for the market. The tree bears when very young, and is very productive. The fruit ripens from the first to the middle of September. The tree should be planted on the pear root. With proper care it does well on the quince, but is injured by being permitted to ripen large crops when young. It bears so early on the pear root that there is little advantage of planting it on the quince.

The *Belle Lucrative* is a healthy and productive tree. The fruit is most excellent, but not of a very high flavor. Although so good a pear it is but little known in the market, and is not nearly so saleable as the Bartlett. The fruit ripens from the middle of September to October. The tree grows finely on the quince.

The *Louise Bonne d'Jersey* is a very healthy and productive tree. The fruit is slightly astringent, but very juicy and good. It ripens last of September and first of October. The fruit is better when grown on the quince than on the pear, and the tree is well adapted to the quince. This is one of the most profitable market pears.

The *Seckel* is a very healthy tree and a good bearer. It needs high cultivation. The fruit ripens in September and October. The tree should be planted on the pear root, but it often does well on the quince.

The *Urbaniste* is a very healthy tree, and always grows in good shape without training. On the pear it is a long time in coming into bearing, but on the quince it bears much earlier. It is peculiarly adapted to the quince. The fruit is excellent, and ripens from the middle to the last of October.

The *Beurré Bosc* is one of the best of pears. The tree is of slow growth, but bears regularly and is productive. The fruit ripens in October and November. It should be grown on the pear root.

The *Beurré d'Anjou* is a strong, vigorous tree. The bark in this vicinity, is sometimes affected with canker. The fruit is large and very fine. It ripens in November and December. It may be grown on the pear or quince.

The *Lawrence* is a very hardy tree, and uniformly productive. The fruit is rather below the medium size, and excellent. It ripens last of November and in December. With care it may be kept into January. It should be grown on the pear root, although it generally does well on the quince.

The *Winter Nelis* is an irregular growing tree. It is very productive. The fruit is small, russetty and very high flavored. It is the best winter pear. In shallow soils, and when not highly cultivated, the tree sometimes loses its leaves before the fruit matures. The fruit ripens in December. The tree does equally well on the pear and quince.

The *Vicar of Winkfield* is a very vigorous and productive tree, and the fruit generally needs to be thinned. It ripens in December and January. As an eating pair it has not the reputation in this vicinity it has in the neighborhood of Boston. Yet here it is often a good eating pear. It is always a good cooking pear. It is admirably adapted to the quince.

The *Easter Beurré* ripens well only in favorable situations. When well ripened it is one of the best eating pears, and can be kept into April. The fruit is much improved by being grown on the quince, to which the tree is admirably adapted.

It will be noticed that some of the most popular varieties are not included in the above list, but they are omitted for what are deemed sufficient reasons. For example, the Flemish Beauty and Duchesse d'Angouleme are not included. The former, although an excellent pear, is liable to crack, and when ripe is in eating but a short time. The tree also frequently loses its leaves before the fruit matures. For these reasons the Louise Bonne d'Jersey and Urbaniste are preferred to it. The Duchesse d'Angouleme is not a regular bearer, and the fruit is not so good, nor will it keep so long in eating as the Beurré d'Anjou. Hence the latter pear is recommended in preference to it. So of other popular and excellent varieties not included in the above list—they may be in some respects superior to those recommended, but it is believed none combine so many excellences for their respective seasons.

Gathering and Keeping Fruit.

Pears are often gathered too early. Most summer and early autumn varieties should remain on the tree until they show signs of maturity by their change of color. The Bartletts, for instance, are finer by being allowed to remain on the tree until they have turned to a yellowish tinge. But they should never be permitted to remain until they become mellow. By picking them from the tree only as they thus mature, they may be kept in eating much longer than they can be if all gathered when the fruit commences to ripen. In most seasons this pear may be kept in good eating to the first of October, if gathered only as it ripens. Pears keep best on the trees. The late autumn and winter pears should remain on the trees as long as the season will permit. When picked, they should be carefully packed in boxes or barrels, and placed under a shed with a northern exposure, if possible, and kept there until required for eating, or until there is danger of their freezing, when they should be removed to a cool cellar. WILLIAM D. NORTHEND.

MIDDLESEX NORTH.

From the Report of the Committee on Apples.

It is a mystery to me that farmers should so neglect their orchards. Trees, by scores and by hundreds, standing in grass, and without any sort of dressing, except the ejections of the enormous crop of caterpillars which they are yearly allowed to produce, and which, in many instances, the trees do not produce foliage enough to sustain, may be seen within the limits of our society. Dead limbs and suckers, so thick and so intertwined that, should the attempt be made to gather fruit by climbing such trees, it would be at the hazard of eyes and wearing apparel. The aspect is truly forbidding, both in relation to clearing off vermin, or gathering fruit in a proper manner, if perchance there should be any. It need not be expected, however, that a large crop of vermin can be reared, and at the same time a crop of good fruit matured. There is another view of the case which appears to me consistent. In districts where such neglect is prevalent, all right-minded persons must, at sight of such negligence, experience a shock in their nerves which can be better imagined than described; and if the nerves are seriously affected, the body must suffer. Apply the axe to the root of all apple and black cherry trees which are not worth caring for and preserving, until they are all razed to the ground. Save what timber is suitable for knife handles, chisel handles, shuttles, etc., and use the balance for fuel. Carefully clear the dead branches and suckers from all remaining trees; dig around, spread compost or wood ashes, or do something to invigorate the trees which need it; and by all means keep them clear of caterpillars and other vermin, in order to preserve the foliage in a healthy state; then you may reasonably hope for compensation and reward in the harvests which will follow such treatment.

The remedies which in my experience I have found to be the best against the insects and their larvæ, which are troublesome in the orchard, may not be out of place here. On young trees the clusters of seed (eggs) may be readily found after the foliage is cast in autumn, and before it starts again in spring. I refer particularly to the caterpillar, which, on older and larger trees, may be more easily discovered when their tents can be seen glistening in the sun. With a ladder visit them very early in the morning when they are all at home, carrying a bail-basket or tin pail, into which the whole mass can be cleanly scooped; yea, a dozen of them at one journey up the ladder. Make clean work, if possible. Then put all, except the vessel in which you carry them, under your *boots*. Brushing, as is usually practised, scatters the crawling worms and kills but few. Petroleum and other oils are recommended by some, and oil of any kind will undoubtedly destroy those with which it comes in contact, but the difficulty is, too many escape, and besides, there is danger of injuring the trees by such applications. Of the autumn caterpillar, which draws its web around the foliage, feeding upon what is inclosed, and gradually extending and enlarging as pasturage becomes necessary, go directly to the colony, using ladder if out of reach, and with your hands take every one, and let the after treatment be summarily performed as in the case of the tent caterpillar. Another worm clusters on the under side of the leaf, and feeds upon the same, making neither tent or web; consequently it is not often discovered until the branch on which it is at work is denuded of foliage. In all cases take them off, and that can be more easily done by cutting every leaf on which they are clustered. In short, my doctrine is this: destroy all vermin that feed on the foliage of fruit trees, and for reasons so obvious that argument is unnecessary.

There is, however, another pest, which must not be overlooked. I allude to the apple-tree borer. He is more stealthy in his operations, working under cover of the bark and generally near the ground. There are exceptional cases, for we not unfrequently find borers in the branches near where they fork. During the months of July and August, and when there has been no rain for a few days, young borers may be readily discovered, and as easily extracted with the point of a knife. Immediately after a shower, which obliterates borers' tracks,—they being in the form of little reddish brown castings or chips, thrown out by the boring larvæ,—it is better not to search for them.

The canker worm, too, is already within the limits of our society, and farmers must be on their guard, or we shall ere long see our orchards burned over in the month of June by that most difficult of all the insect pests to eradicate.

I cannot forbear writing a word in relation to the birds which feed upon some if not all the insects and their larvæ to which allusion has been made. The titmouse and woodpecker are known to belong to that class, and remain with us during the year. The tongue of the woodpecker being very elastic,—capable of extending the point (hard and armed with hooks,) an inch and a half, more or less, beyond the point of beak,—they are peculiarly adapted to the harpooning of all larvæ imbedded in the bark of trees, such larvæ being their principal food. Now the woodpecker, titmouse, blue bird and others which could be named, make no depredations upon our fruit, but live exclusively upon insects and their larvæ, and ought to be encouraged to remain with us without fear for their lives; and, in order to do this, let those who have orchards save pieces of dead limbs and punk wood, such as the birds named like to breed in, and place them in trees where they will be accessible to them, keep heartless boys and still more heartless men from shooting them, or otherwise frightening them away, and we should be surrounded by friends who would protect our orchards from insect marauders.

All fruits are more highly appreciated than formerly, and I have no fears that care and attention bestowed upon the raising of good apples will not be rewarded by a discriminating public.

Asa Clement.

MIDDLESEX SOUTH.

Statement of James W. Brown.

The orchard I offer for premium contains eighty-two trees, mostly Baldwins, with a few Hubbardston Nonesuch, Mother Apple and Hunt Russets. The trees were set in April, 1858. The holes were well prepared by digging over, pulverizing and enriching the soil, for a space of about six feet across and fifteen to eighteen inches deep. This done, the trees are sure to start and grow well the first year.

The soil of this orchard is naturally moist, with a yellow loam and hard blue gravel subsoil. But little manure has been used on the land since the trees were set. Two dressings of peat mud have been thrown about them at different times in the past five years. I prune in June, forming the top about six feet from the ground, not too flat, as Baldwins naturally run up, while Greenings spread out and hang down. I have kept the orchard free from the caterpillar and the army worm, and no canker worms have yet appeared. I wash the trees in June with potash water, of about one and one-half pounds of potash to two gallons of water. The orchard is in a thriving, healthy condition. I have gathered a few apples only, but there are only a *few* apples on any trees in this neighborhood this year.

Let farmers prepare the soil properly and give proper care to their young orchards, and they will see a satisfactory result. Young trees must not be set in *post holes*, as was formerly done, with the roots jammed in and the holes filled up solid, and when, if the tree leaved out the first year, the delighted owner exclaimed, "*It is alive!*" but the soil should be prepared broad and deep, with every root spread out carefully and naturally. Then the tree will get such a start the first year as it will never forget, and it will amply repay all extra labor in the coming years. I have set fruit trees the past season that have already grown from thirty to forty-two inches.

I advise, either to enclose the field well, keep out all animals *entirely*, prune, cultivate, protect from insects, and take care of your trees as you would a choice garden plant, or not attempt orcharding at all. Forty years ago a gentleman purchased fifty apple trees, and employed an English gardener, who understood the business, to set them out, while he himself was absent for a few days. Returning, after two days, he found, to his great disappointment, that the gardener, with hard labor, had planted but *ten* trees. The next day sufficed for the gentleman and the gardener to set out, "after a fashion," the remaining forty trees. But after years proved that the ten trees faithfully and thoroughly planted, and thereby properly started and brought forward the first year, were of more value than the remaining forty. Thorough culture in orcharding will repay, while a slack and slovenly one will not. JAMES W. BROWN.

FRAMINGHAM, September 5, 1865.

WORCESTER NORTH.

Statement of Ephraim Graham.

The orchard I offer for the society's premium consists of fifty-six trees, all of which are Baldwins, transplanted May 6, 1862.

The land was an "old bound out pasture," producing only a small quantity of feed; but laurel, hard-hack, so called, sweet fern and mullein were in abundance; the surface soil is a light, sandy loam generally; the subsoil, by no means calcareous, but clay intermixed in small quantities with gravel and loam, and in some parts of the field small quantities of sand, so that on the whole the soils are not what are generally termed favorable for the growth of fruit trees or the best of fruit.

The field has a southern slope and is well sheltered from the north and north-west winds by another orchard and buildings adjoining the same.

In 1861 the field was twice ploughed, as well as could be done with four oxen, and about twenty-five loads of manure spread to the acre and planted with potatoes.

In 1862 the stones were removed and the field well ploughed. The ground was then staked off into rows thirty-two feet distant each way, and the holes dug about twenty inches deep and from five to six feet in diameter and filled with compost prepared the year previous, composed of loam, leaves, decayed wood, leached ashes and a small quantity of barn manure. The object of preparing the borders so large is to give a rich and fertile soil for the small roots to penetrate during the first two years after transplanting. The trees were selected from two nurseries, twenty-five of which were four years from the bud, and upon an average one and a quarter inches diameter, and are at this time, September 20, from three to three and a half inches; the remainder of the trees were two years from the bud and from five-eighths to seven-eighths inches in diameter and are now from two to two and a half inches. The field was sowed with oats, with the exception of one square rod around each tree, in order to make it an object to hoe and cultivate around the trees. I would here mention that during the month of May, 1862, the weather was quite dry, so much so that many of the trees showed no signs of foliage, and the lives of some of them were almost despaired of for a time; in the course of the season, however, many of the trees made very respectable growth, throwing out shoots from eight to ten inches, others showing no indications of shoots, simply foliage, the younger and smaller trees making the greater number of shoots.

In 1863 the stones were removed and the field ploughed and planted with stover corn and potatoes, a small quantity of manure spread to each tree.

In 1864 the field was again planted with potatoes and beans, spreading around the trees as in the year previous; during this year the growth, notwithstanding the dry season was greater than in previous years, throwing out shoots from thirty-five to forty inches.

In 1865 the boulders and small stones were again removed from the field, being sufficient to make fifteen rods of wall, and about thirty loads of compost applied to the field, made from muck, decayed wood, three loads of horse manure and three loads leached ashes, and planted with potatoes, corn and white beans; thus the whole field has been under cultivation with some hoed crop since first transplanted, and should continue to be so cultivated for the next ten years. The question now arises whether it is more profitable to transplant large or small trees; it is certain, thus far, that the small trees have made, comparatively, the greater amount of wood.

In the opinion of very good judges of orchards, the larger trees will come into bearing at least one year sooner than the others. Should that be the fact, it is economy to set trees of older growth than two years from the bud.

Ephraim Graham.

Statement of Charles Mason.

The apple orchard offered by me for a premium consists of fifty-three trees, of which twelve were set out the latter part of April, 1862, thirty-seven about the 20th of May, 1863, and six in May, 1864.

Of the trees, twenty-seven were raised by myself, and twenty-six, all of them but one set in 1863, were procured from a nursery. Of these latter I am obliged to say they were not of the choicest, being such as I could get, rather than such as I would have had.

Of the trees raised by myself, nine were set in 1862, when a year old from the bud, most of the others at two years old. The age of the nursery trees I cannot state positively, but suppose them to have been three years from the bud when set. The advantage, however, which they had, in point of age, was fully compensated by the more careful treatment which my trees had previously received, and by their having been taken up properly and transferred while the roots were fresh, to the places where they were to stand. My largest trees, except two which are somewhat older, are those which were set in 1862, when one year from the bud, some of which measure nine inches in circumference. Trees that have had one year's free growth from the bud, and have become well confirmed upon the stock, if taken up, as they well may be, with the roots nearly entire, and transplanted immediately, will grow right along without seeming much to feel the removal.

The soil in which my trees are set is very light and sandy, insomuch that persons sometimes have been led to entertain a doubt in their own minds of its capability to bear anything to much purpose. Underneath the surface soil is found, mainly, gravel or sand of different degrees of fineness.

Of the trees, twenty stand twenty-five feet apart, in a row, by the roadside. The other thirty-three are in three rows, thirty feet between the rows, and the trees twenty-seven feet apart in the rows, upon ground sloping to the north-west, and so steep that the upper row stands upon an embankment or terrace. This land was completely waste, overgrown with laurel and other shrubs. The bushes were cleared off and the ground ploughed, as well as it admitted, and after a couple of years' hoeing, being partially subdued and smoothed down, the trees were set, the first in 1863, the rest the next year. The ground has been ploughed and cultivated from year to year with hoed crops, chiefly potatoes and beans, and manured for planting, but only in the hill, and that quite moderately.

When the trees were planted, places were dug for their beds eighteen to twenty-four inches in depth, and five feet or more across. These were filled again with the best of the surface soil about the spot, intermingled with a bushel or so of leather chips and waste, and as much, or rather more compost from barn cellar, consisting of loam, barn manure, vegetable waste, and the like, with sink water, &c. When these ingredients were well forked over, a peck or thereabouts of leached ashes and two quarts of air-slaked lime to each tree, were spread upon the surface and slightly dug in, and then the trees were set.

Since the setting I have had, every year, a few shovelfuls of the same compost spread about each tree and dug in with the soil in the spring. Through the summer the ground about the trees has been hoed over occasionally to keep the weeds down and the surface light. After some of the trees were set, the weather proving dry, I had such of them as were in the most exposed situations, mulched to some extent, a thing, by the way, well worth doing in all cases, especially with young trees.

These things, together with clearing the trees thoroughly of caterpillars, when occasion required, and a little pruning, constitute about all the care and attention they have received. I have not aimed or desired to force the growth of the trees, and with the soil such as it was, and the comparatively slight manuring that has been bestowed upon them, the growth they have made has been, in the main, to me quite satisfactory.

The pruning that has been done to the trees has consisted in cutting out shoots when too thick or interfering, and in the spring, heading back such as were too luxuriant, or straggling, or where the habit of growth of the tree is too aspiring; the aim being always to keep the trees *well down*, alike for convenience and for their own security, and to preserve the heads handsomely proportioned and well balanced and open to admit freely the light and the air.

My orchard is made up of the following varieties: winter—Baldwins, 17; common apples, 5; Roxbury Russets, 4; R. I. Greenings, 3; Esopus Spitzenberg, Tompkins County King, Peck's Pleasant, and Hubbardston Nonsuch, 2 each; Mother Apple, Wagener, Yellow Belle-Fleur, and Seek-no-further, 1 each; fall—Gravenstein, 2; Foundling, Red Astrachan, Gordon Royal, Williams' Favorite and Sops-of-wine, 1 each; sweet—Ladies' Sweeting, Danvers Winter Sweet, Jersey Sweeting, Autumn Sweet Bough, and Early Sweet Bough, 1 each.

The admission of so many kinds in so small a collection may not, perhaps, be readily vindicated, in a purely prudential point of view. Were one rearing an orchard for the sole purpose of raising fruit for the market, he would, doubtless, best consult his interest by having all or nearly all his trees Baldwins, that being an apple of approved quality and always saleable, and being the tree which hereabouts is, on the whole, unrivalled as a bearer. Still, this one kind does not meet the demands of all seasons; besides that, some variety is always desirable. One would scarcely, but from necessity, be without some good fall apple, like the Gravenstein or Foundling, or the Roxbury Russet or its equivalent, for the latter part of winter and spring, or good sweet apples for both autumn and winter. A person, therefore, who is planting an orchard from which he designs to select fruit for his own use, may be indulged in some latitude in the selection of a larger number of kinds, of admitted excellence, even at the risk that some of those kinds may be found, upon trial, not to succeed well in the particular locality.

CHARLES MASON.

FITCHBURG, September 27, 1865.

PLYMOUTH.

From the Report of the Supervisor.

Statement of P. Lincoln Cushing, of Middleborough.

The pear trees entered for the society's premium in 1865 number three hundred and sixty-five. They are mostly of the well known standard varieties. The rest are selections from those that have proved valuable in other localities, and a few that are comparatively new have been introduced to test their adaptation to this vicinity. Nearly all were planted in the spring of 1859—some before, a smaller number since. Nine-tenths, at least, are imported trees, from two to six years of age at the time of planting, the older ones having been purchased at nurseries, and the two year olds, which were by far the greater part, as they came in the cases from France. A few were obtained of a travelling agent, but as only one in ten proved true to name, and did not come up to the standard of excellence promised, little confidence has since been felt in that mode of purchase. One-third are on the pear, and two-thirds on the quince stock. They are set in rows twelve feet apart; those of the quinces six feet apart in the rows, and the standards three times that distance, with dwarfs between. The soil is a loam, from which some stone, large and small, have been removed, and is underlaid by a gravelly clay at the depth of from two to three feet below the surface. A general slope towards the south-west does not allow surplus water to remain where it falls, and I have noticed that the lower side of the garden is more moist than the upper, especially in the spring.

When I came into possession of the place where I reside, I found some forty pear trees which had been set two years previously. A few had grown a little; the rest had not made an inch of wood, and were in a dying condition. It would have been a matter of economy to have removed them from the ground at once, as full three-fourths of the whole number eventually died. I satisfied myself that the ground had not been stirred sufficiently deep in setting, and determined to avoid this error. Accordingly, I had the holes dug at least two feet deep and five to six feet in diameter. The surface soil was placed in the bottom of the holes and about the roots and trunks of the trees, care being taken to place the roots in their proper position, and to fill all the openings about them with mellow earth. The earth was allowed to settle without pressure, and no water was used except to moisten dry roots previous to setting, which I have found to be well; and when trees have been out of the ground some time, submerging in water twenty-four hours has been attended with good results. Previous to throwing in the subsoil, the earth which remained undisturbed, like a partition, between the holes, was thoroughly worked; and a continuous trench thus formed the entire length of each row. This was done for two reasons—to furnish a continuous bed for the roots of those on the quince stock, and to secure more thorough drainage. The holes, or trench, being filled up, the ground about the trees was manured in the same manner and to the same extent as the remainder of the space between the rows, at the rate of from eight to ten cords to the acre.

I am satisfied from the subsequent experience, that it would have been far better to have mixed a few shovelfuls of well rotted manure with the soil placed about the roots, or to have thrown an equal quantity of almost any kind of generous stable or compost manure upon the cone of earth about the tree, previous to throwing in the subsoil. A number of small trees which had a mixture of one pint of ground bone to three pints of coal ashes, thoroughly incorporated with the soil, coming in contact with the roots, have done admirably, better than some which had, instead of the bone and ashes, a quart of the bone alone mixed in the same manner. Of course, on land that has been heavily manured two or three years previously, trees may be planted without additional fertilization; but observation has convinced me that the pear will not thrive and give a return of full, well-grown fruit without generous culture.

I aimed to set the trees on the pear stock at as nearly the level they were taken from the ground as possible; those on the quince at two or three inches above the line which marks the union of the graft with the stock, in order to pear-root them; and have been successful with a large number. Some, placed deeper, did not thrive; and I do not think it well to exceed three inches. I have been thus particular in the matter of setting the trees, because I am persuaded that success in growing the pear, especially upon the quince, is largely dependent upon doing this part of the work well; and I have never known trees to refuse to grow, if they would grow at all, where the course here indicated was substantially followed.

The ground on which these trees stand has been kept open, with the plough, where it could be done without injury to the roots, and with the spading-fork about the trees. It has received a moderate dressing of stable or compost manure annually, and been cropped with potatoes or garden vegetables, with the exception of that portion on which the larger trees stand, the present year. It has yielded, I should say, nearly or quite enough to pay for what has been expended upon it, apart from the cost and setting of the trees; but as it properly belongs to them, I have sought to avoid withdrawing what was intended for their support. Three hundred and fifty are in a thrifty condition, and a large number have made what may be called a luxuriant growth; though I am of the opinion that they would have made a decided growth sooner, and been in advance of where they are now, if they had been manured more heavily at the outset.

To have trees start *at once*, should be the aim of every one who sets them; and the opinion which has prevailed in times past, that they are injured by such treatment as we ordinarily give a good crop of corn, is very easily proved, in practice, to be erroneous. I have not been able to bestow upon mine all the care I would have been glad to; but I have done what I have to insure form and substance to the tree, without present anxiety for the crop of fruit. All have been headed in closely, to bring them into shape and prevent a slender growth, unable to sustain itself when fruit shall appear. Some have borne well, one, two, three and four years, while others have produced a few specimens only. It was my purpose to have spoken only of the varieties I have fruited, their excellences or defects as they have developed themselves with me, the habits of the trees as free or slow growers, and early or tardy bearers; but this statement has already been extended to as great length as is desirable. I will only add, that the pleasure which I have derived in their cultivation and progress, in such leisure as I could command from other duties, and the advantage received to health, impaired by too close and constant confinement to a sedentary life, has more than repaid any labor bestowed.

MANURES.

ESSEX.

TURNING IN CROPS.

The committee on turning in crops as a manure respectfully report, that there were no entries for the premiums offered, it being the usual experience of the society, showing that there is but little interest or experiment upon the subject in the county. Hoping to induce some experiments in future, your committee would mention some results which have come under their observation.

Mr. A. Orne, of Marblehead, in April of 1864, spread upon a lot of run-out grass land a heavy dressing of manure, which caused a rapid and luxuriant growth of grass. On the 6th of June, the whole was ploughed under, and the lot planted with various garden vegetables; but no manure was used in the hill. The green crop produced a rapid decomposition of the sod; the land was very mellow and friable during the season, producing very abundantly of the several crops planted,—much more so than an adjoining lot, which was broken up earlier, before the grass had grown.

We would especially refer to the very satisfactory results of Daniel Buxton's experiment, published in the Transactions of the Society for 1850. His statement is, that a piece of land, to which little dressing was applied, except a crop of oats ploughed in the previous autumn, produced 700 bushels of onions per acre.

The chairman would also refer to his own experience; having on one occasion sowed oats early in the spring, and on the 10th of June ploughed in a heavy growth and sowed carrots; but, owing to the very dry weather, the seed did not germinate, and afterward sowed flat turnips, that grew a very large crop. Also, having sowed winter rye in the fall, and ploughed it under about the 25th of May, with very satisfactory results.

The committee conclude that the farmers are deterred from making use of this method of fertilizing their lands, by the fear of losing their annual crop. If such were the result, it might well be considered unadvisable; but, as has been shown by the above experiments, barley or oats may be sown after an early crop of pease, potatoes or onions have been harvested, and attain a large growth to be ploughed in, before frost cuts them down, putting the land in excellent condition for a crop the next season, with a small addition of some more concentrated manure to give it a start. Or winter rye may be sown late in the fall, and spring grain might be sown and attain a heavy growth in season to be ploughed in for any crop that may be planted about the 1st of June.

This method of cultivation is more especially adapted to land in good condition, as very poor land might not produce sufficient growth (without a dressing of manure,) in so short a time as to make it an object.

These hints, gathered from the observation of your committee, are offered, hoping they may be suggestive to the farmers, who improving upon these methods of application, according to the wants and conditions of each individual case, will in future compete for the premium offered for turning in crops as a manure.

Benjamin P. Ware, *for the Committee.*

HIGHLAND.

Statement of C. O. Perkins.

One and one-half acres.—Crop—clover, red-top and herdsgrass; cut July 4th; weighed July 5th, when well cured. Plot No. 1, manure, ploughed deep, 257 pounds; No. 2, manure, ploughed shallow, 316 pounds; No. 3, manure, harrowed, 301 pounds; No. 4, manure spread on surface, 304 pounds; No. 5, no manure, 115 pounds. Synopsis of the weather:

	First Third.	Second Third.	Last Third.
May, ...	moist.	moist.	medium.
June, ...	medium.	medium.	medium.
July, ...	medium.		

The ground was an old worn-out pasture, that had been neither ploughed nor manured for the last fifteen years.

Remarks.

From the numerous experiments I have tried, and from my general experience, I am satisfied that manure should be applied at or near the surface. That the rootlets of most plants are found within two or three inches of the surface, that they may be under the influence of the heat of the sun, dew and small rains; that the tendency of manure is downwards, not up; that manure affects vegetation by the heat it produces; that the heating effects of the manure tends to decompose all dead vegetable and animal matter; that the good effects of manure (all other things being equal,) will be in proportion to the amount of dead, perishable matter in the soil.

C. O. PERKINS.

GRAIN CROPS.

ESSEX.

From the Report of the Committee.

The first field, visited by the committee, was that of Jesse Smith, of West Haverhill. It contained about two acres, the soil being a strong, hard, rocky loam. Many large stones had been taken from it, and a part of it had been underdrained. Mr. Smith's mode of ploughing was new to us. He showed us a field which he had ploughed this summer, a few inches deep, and the grass appeared to be all killed.

His estimate of the cost of seed and planting an acre of corn would seem low to those who are in the habit of putting all the manure in the hill. Our impression is, that the farmers in this country spend on an average $8 per acre in forking over manure and planting an acre of corn. Mr. Smith's estimate makes it cost him 63 cents per bushel to raise corn; and it will be seen by his statement that his estimate of the fodder is much less than is commonly found by those who enter their corn for premium. He does most of the cultivation with the hoe, and it will be seen by the statement that it costs $9 to cultivate an acre.

The next field which the committee visited was that of M. F. Hill, of Byfield. It contained between three and four acres, the soil being a dark loam, free from stones, with a clay subsoil. It will be seen by Mr. H.'s statement that he used the hoe but little in cultivating, and put the cost at $4 per acre.

When we visited the fields, we were undecided which would yield the most, this or Mr. Smith's, and by the statements, there was not one pound's difference between Mr. Smith's and Mr. Hill's. The former was weighed two weeks before the latter, but it was a smaller kind of corn; and we think it was in about the same state, when weighed, as the other. Mr. Hill's corn cost him 73 cents per bushel; his manure costing more, and his labor less, than Mr. Smith's. He husked his corn as they do at the West, and left the butts standing.

We next viewed the field of Oliver P. Killam, of Boxford, which contained about six acres, and we were pleased with the neat appearance of this field. The surface is somewhat uneven, yet the rows were all as straight as the squares upon a chess board.

If we call the potatoes at one-half the value of the corn per bushel, his corn cost him $1.32 per bushel. We think that this crop was injured by the dry weather much more than the other fields. It will be seen by the statements that all the crops had the manure spread, and none put in the hill;—how far it is best to practise this may be questioned by many. It will be seen by the statements, all the fields were planted late. Mr. Smith's was all harvested in four months from the time it was planted. We do not often have a season when so large a crop will mature in that time, when all the manure is spread. The month of June was peculiarly favorable this year for those fields where the manure was spread; and the frost did not injure vegetation so early as usual.

We often hear it said that the farmer should know what it costs him to raise a bushel of corn, as well as the manufacturer can tell what it costs to make a yard of cloth or a pair of shoes. Who can tell Mr. Smith how much his corn may be injured next year by being blown down? how much by frost? how much by rust? how many smutty ears he will have? how much the birds will destroy? how much the worms will injure? He has escaped these evils this year, but they are evils which the most careful and skilful cultivator cannot avert. We have the general promise that "seed time and harvest shall not fail," but an All-wise Being is teaching us by his providence that the amount of the harvest is, in a measure, dependent upon causes over which we can have no control. It is only by long-continued observation that the farmer can calculate how much his crop will be injured by frosts, storms, drought and worms,—and of these he can only judge by the past. He knows not what the future may be. Our impression is that the same amount of labor and manure that has been applied by Mr. Smith and Mr. Hill, the past season, and yielded eighty bushels to the acre, would not have produced more than sixty bushels of sound corn on an average for the last ten years.

The price of corn this year is comparatively low, yet we think this should not prevent those who live remote from market from planting it, as when it is fed to cattle or swine it yields a good return; and those who have to rely upon the manure made on the farm will find it one of the best crops to keep up the fertility of the farm.

WM. R. PUTNAM, *for the Committee.*

Statement of Jesse Smith.

CORN.—The crop covered an acre.

The crop on the land, in 1863, was grass, no manure being used.

Crop of 1864, corn—twenty loads of compost, half stable manure and half loam, being used; soil, generally loam.

The field was ploughed lightly in the fall of 1864, and again in spring of the present year, eight inches deep—harrowed well and furrowed. Cost of ploughing, etc., $5.

Twenty loads of manure were applied and spread. Value, $30.

Planted last of May, in hills three feet apart one way and four the other, with eight quarts Canada improved corn. Cost, $2.

Cultivated once in each row, both ways. Cost of cultivation, including weeding and thinning, $9.

Harvested the last of September. Cost of harvesting, $6.

Recapitulation.

Cost of ploughing,	$5 00
manure,	30 00
seed and planting,	2 00
cultivation,	9 00
harvesting,	6 00
Total,	$52 00

Product.

Fodder, 1,300 pounds, and 6,600 pounds ears of corn—equal to 165 bushels—producing, when shelled, thirty-four and one-half quarts to the bushel, and weighing sixty-three pounds to the bushel.

Remarks.

The crop in 1863, by the above statement, was grass. After taking it off I ploughed the land very lightly, as my custom is, using one man and a yoke of oxen. In the spring I ploughed it eight inches deep, picked the stones, harrowed it twice, furrowed and planted, as above. In ploughing deep we have great advantage, being easier cultivated, standing the drought better, and producing larger crops. The land in this part of the county, with some exceptions, has been neglected. My method is to plough deep, pulverize well and hoe three times, as it tends to preserve the moisture and kill weeds. I never use the cultivator the third time hoeing, as it exposes the fibres to the sun and checks the growth of the corn.

Statement of M. F. Hill.

The crop of 1863, on the field on which the corn is planted, which I offer for premium, was grass, no manure being used. The crop of 1864 was corn, and the quantity of land one acre. Fifty loads of coarse manure, ploughed in, and ten loads compost—half muck and half manure—put in the hole, in 1864. The subsoil is clay.

The land was ploughed once about the middle of May, 1865, eight inches deep, and harrowed. Cost, $5. Twenty-five loads of manure was spread and ploughed in. Value, $45. It was planted May 25th—rows four feet apart each way—five kernels of eight rowed corn in the hill. Cost of seed and planting, $3. Cultivated June 5th, twice in a row each way, and about June 12th ploughed both ways and cultivated one, and hoed July 20th and cultivated both ways. Cost of cultivation, $4. The stalks were cut September 1st, and the corn husked in the field October 12th and 13th. Cost of harvesting, $4.

Product.

200 bundles of top stalks, together with the butts, valued at $10; 6,600 pounds of corn in the ear, equal to 165 bushels.

The principal part of the labor of cultivation was done with the plough and cultivator, in consequence of which the cost has been less than when the hoe alone is used.

A man and horse can plough four acres of corn in a day, turning the furrow away from the rows when small, the next time using the cultivator to level the ground, which can be done as often as the weeds start. I have found that stirring the ground three or four times, and leaving a flat surface, gives the corn a much more vigorous growth, than by the old process of weeding and hilling.

MIDDLESEX.

From the Report of the Committee.

The details of a successful growth of any kind of grain interests every one, and would be read attentively by all persons engaged in agriculture. Exactness gives much value to his experience and confidence in his own ability; guess work is very uncertain, varying with different individuals more than fifty per cent. We take it for granted that the farmer who is successful in one especial branch of farming, with a certainty may be in most any other if he applies himself. Now, we believe that many of the different grains can be raised on the farm, for the consumption of the family, (and perhaps for the stock,) with profit; still, grass is the foundation of all good farming at a distance from market,—and that the grains should only be raised as preparatory to grass.

The value of the farm is not in its acres, but in the amount of English grass it produces. Again, the profit of farming (if it is profitable,) must depend on cultivation. The amount of cultivation must depend on the quantity of manure at your disposal; but the quantity of manure depends very much on the grass grown,—the more grass we raise the more stock we keep; the more stock, the more manure to make land rich and raise grain. Grass, if we have it to sell, brings a good price, but no one can tell in the spring which of the grains will sell well in the fall.

We have now the great West, with all her natural resources, to contend against. Corn is raised more abundantly in this country than any other grain, and we prefer and recommend it above all others for its profitableness, its ease of cultivation, for its great amount of valuable fodder,—often more than paying the fall work,—and for its leaving the land in such good condition for a future crop. It requires from eighteen to twenty days' work, only, on each acre. A case has been reported, the past winter, of corn being raised at a cost of twenty-one cents per bushel for the labor alone. We knew one farmer to sell, last year, one thousand dollars' worth of the crop of 1864.

In raising corn, plough thoroughly, manure well, furrow or line out both ways three feet three inches, thin down to three stalks, and be sure that every hill has that number; keep in advance of the weeds by running the cultivator through both ways for three or four successive weeks, and therefore save much labor in hoeing; hoe level, as corn raised on a flat surface, when the weeds are destroyed and ground kept loose, will not suffer by the drought as when hilled. Many farmers practise sowing grass seed the last hoeing, and we commend it as a saving of much labor in ploughing for other grain, and also saves the great drain in straw and maturity of seed. Wheat, (the grain of the world,) we think, can be raised profitably when the better system of cultivation is forced on the farmer of the old States. All cannot go West. Much more work must be done on less surface. The poverty caused by sowing exhausting crops, such as rye, oats and the like, must be repaired by the application of more manure, rotation of crops and finer tilth. Wheat can be raised by restoring the vegetable taken from the soil. Very fine samples were offered by J. B. Moore, of Concord, and Samuel Hosmer, of Acton, to whom we award the first and second premiums. Their statements give description, &c.

Rye.—This useful grain is capable of being cultivated on most kinds of lands, but it is generally grown on light, sandy soil. We very much doubt the advantage, in the end, of sowing it, except on a very rich soil,—too rich for wheat,—or where wheat would lodge. Many farmers sow it on their exhausted lands too poor to grow anything else, and expect to get a remunerative crop. The cost of labor is equal to the worth of the crop, and the land left in much poorer condition. We fail to see the advantage in such management, or how such farming will make the farmer skilful, prosperous or thriving. When land is to be brought into a pasture, it is a mistake to raise rye, although we may receive more ready cash by so doing, but, in the end, more would be realized by seeding with grass alone. We have only spoken of some of the most important grains.

E. Wood, *Chairman.*

Statement of John B. Moore.

Wheat.—I offer for inspection one bushel of white winter wheat (name of the variety is unknown to me.) It is a bald wheat, and very early ripe, and cut the third and fourth days of July. From accurate measurement of seven square rods, which, after being thoroughly dried and threshed, yielded 119 pounds of clear wheat, which, by measure, weighed 62 pounds per bushel. An acre, at the same rate, would have yielded 45$\frac{1}{3}$ bushels, of 60 pounds each.

The soil upon which it was grown is a black, sandy loam, rather moist, upon which there had been raised a crop of corn fodder in 1864. The first week in September, soon after the same was gathered, the land was ploughed and the corn stubble gathered and carted off; then a dressing of twenty-five horse-cart loads of compost manure, from the cow yard, spread upon the ground. It was then sowed with wheat, at the rate of one bushel to the acre, and the whole wheat and manure ploughed in to the depth of four inches, as near as possible, then sown with grass seed, harrowed with a brush harrow, and finished by rolling. The grass seed took finely, and the last of August, 1865, I cut a very good crop of grass upon the same ground.

I claim that this variety has the following good qualities: First, it is earlier than any variety with which I am acquainted, and, for that reason, escapes the fly entirely; second, it threshes easily; third, it is quite hardy; fourth, the quality is equal if not better than any other when milled, making a very white and sweet flour.

JOHN B. MOORE.

CONCORD, Sept. 21, 1865.

Statement of S. Hosmer.

RYE.—I present for inspection one bushel of winter rye, a sample of 326 bushels, raised on my farm, this year, from 19 acres. I cut the wood and cleared 20 acres, in the winter of 1863–4; burnt the brush the 11th of August; sowed the rye the last of August and first of September; sowed 18 bushels on 20 acres. The land is uneven; some knolls and low land. About three quarters of an acre was covered with water so long, in the spring, that it killed the rye. I cut up and sold 3,700 pounds of straw, when green, for braiding. The straw was very long and stout; it was stated by the editor of the "New England Farmer" and others, who saw it, and those who harvested it, to be as handsome a field of rye as they ever saw.

The land is a gravelly loam. I think, if we had had a plenty of rain at the time of sowing, we should have had a much larger yield. From my experience, I think early sowing is much the best, as the roots are larger and get stronger hold in the ground before the ground freezes, and forces the stalk faster in the spring, and the rye will be fit to cut earlier.

SAM'L HOSMER.

ACTON, Sept. 15, 1865.

MIDDLESEX NORTH.

From the Report of the Committee.

There were three pieces of corn entered for premiums, two in Dracut and one in Chelmsford. The piece entered by Mr. Sawyer was on dark, loamy interval land, back about one hundred rods from the Merrimack River. The soil, naturally moist, was well adapted to stand without disadvantage the long drought of the past season. This land having been ploughed in November, 1864, with Michigan double plough, nine inches deep, received in the spring a dressing of manure or compost composed of muck and night-soil, two-thirds of the former to one-third of the latter, thirty-two loads of thirty bushels each to the acre being spread and ploughed in, from four to five inches in depth. The ground was rowed one way, the rows being three and a half feet apart and the hills a little less than two and a half feet apart, giving thirty-five hills to the square rod. This piece yielded $128\frac{12}{32}$ bushels per acre, and the corn was very sound and nice.

Mr. Coburn's corn was raised on land similar to Mr. Sawyer's, but we think not quite as moist. This field had been planted with corn the previous year, and received a compost of stable manure and loam at the rate of three and a quarter cords per acre. This season seventeen loads per acre, in the proportion of two-thirds stable manure and one-third night-soil, were spread and ploughed in about seven inches deep. The ground was then furrowed and manured in the hill with night-soil at the rate of one and a quarter cords per acre. The rows were about three and a half feet apart, and we found twenty-nine hills to the square rod. The cultivation was thorough and the crop looked well. The yield was one hundred and five and five-eighths bushels per acre.

Mr. Hodgman's corn was raised on very different soil from the other. It was a sandy loam, and in many places the ledge which seemed to underlie the ground came to the surface. This land, which had been pasture, was planted the previous year, and manured at the rate of eighteen loads per acre. This year it has received ten loads to the half acre, or twenty loads per acre. We do not learn that Mr. Hodgman uses any manure but that made upon his farm. He mixes loam freely with the droppings of his cattle and keeps his hogs at work as composters, and the result is a large and valuable pile of manure at small cost. His corn suffered much from drought, but still yielded at the rate of $74\frac{32}{57}$ bushels per acre—a result speaking very favorably for the thorough cultivation bestowed upon it. Although feeling that we must award premiums as given, yet we feel that Mr. Hodgman deserves special commendation for the results he secured, and we hope that our farmer friends may take courage by his example and never despair of good crops, though they labor upon more rugged soil than some in the river valleys. This corn was not planted so thick as in the other fields, the ground being rowed both ways. There were twenty-five hills to the square rod.

We wish to suggest to farmers the importance of being more exact in keeping farm accounts. We believe it to be possible to know the *exact* cost of producing half an acre of corn or other crop, and then "estimates" will not be needed. We recommend that in early spring each farmer who thinks of competing for a premium on corn, measure off the half acre on which he expects to raise seventy bushels or upwards per acre, and keep a careful account of every hour's work done upon it, and also measure the seed; for, small a matter as this is, the rules of the society require the amount, and if one man plants twice as thick as another the difference in quantity is manifest.

Statement of Rapha W. Sawyer, Dracut.

What was the crop of 1863? Grass.

What manure was used, and how much? None.

What was the crop of 1864? Grass.

What manure was used, and how much? None.

What is the nature of the soil? Dark loam.

When and how many times ploughed, and how deep? Twice; once in November, 1864, with Michigan double plough, nine inches deep, and once in May, 1865, four to five inches deep.

What other preparation for the seed? None.

Cost of ploughing and other preparation? Eight dollars per acre.

Amount of manure, in loads of thirty bushels, and how applied? Thirty-two loads per acre, spread and ploughed in.

Value of manure upon the ground? Sixteen dollars per acre.

When and how planted, and the amount and kind of seed? Planted 16th and 17th of May; six quarts per acre; eight to sixteen rowed yellow corn.

Cost of seed and planting? Two dollars per acre.

How cultivated, and how many times? Twice, one way, and hoed twice.

Cost of cultivation, including weeding and thinning? Four dollars per acre.

Time and manner of harvesting? October 10th. Husked in field, shelled, measured and weighed the corn of one rod. The remainder of the crop was not then harvested.

Cost of harvesting, including the storing and husking or threshing? Five dollars and ten cents estimated expense for the half acre.

Amount of straw, stover, or other product? Estimated twelve dollars per acre.

Statement of Mr. Willard Coburn, Dracut.

What was the crop of 1863? Grass.

What manure was used, and how much? None.

What was the crop of 1864? Corn.

What manure was used, and how much? Stable manure, mixed with loam, three and a quarter cords per acre.

What is the nature of the soil? Interval land.

When, and how many times ploughed, and how deep? Ploughed once, May 10th, about seven inches.

What other preparation for the seed? Harrowed and furrowed, and manured in the hill with one and a half cords night-soil per acre.

Cost of ploughing and other preparation? Three dollars per acre.

Amount of manure, in loads of thirty bushels, and how applied? Seventeen loads, two-thirds stable manure, one-third night-soil, spread and ploughed in.

Value of manure upon the ground? Twenty-one dollars.

When and how planted, and the amount and kind of seed? Planted May 15th, six quarts of seed to the acre; called the Perham and Canada corn, mixed.

Cost of seed and planting? One dollar and seventy-five cents.

How cultivated, and how many times? Ploughed twice the same way, and hoed twice.

Cost of cultivation, including weeding and thinning? Five dollars and fifty cents.

Time and manner of harvesting? Harvested an average rod October 10th. The rest of the field was to be harvested immediately.

Cost of harvesting, including the storing and husking or threshing? Five dollars per half acre.

Amount of straw, stover or other product? Twelve dollars per acre.

Statement of Mr. Asa Hodgman, 2d, Chelmsford.

What was the crop of 1863? Pasture.

What manure was used, and how much? None.

What was the crop of 1864? Corn. Nine loads of manure put on.

What manure was used, and how much? In 1865, compost, half stable manure and half soil, ten loads to half acre.

What is the nature of the soil? Sandy loam.

When, and how many times ploughed, and how deep? Ploughed first time, April 7th. Second time, May 5th, seven inches deep.

What other preparation for the seed? Harrowed and furrowed.

Cost of ploughing and other preparation? Three dollars and sixty cents.

Amount of manure, in loads of thirty bushels, and how applied? Ten loads, spread on the surface and ploughed in, April 7th.

Value of manure upon the ground? Seventeen dollars and fifty cents.

When and how planted, and the amount and kind of seed? Planted the 15th of May. Dropped by hand and covered with a hoe. Mixed varieties of corn.

Cost of seed and planting? One dollar and fifty-two cents.

How cultivated, and how many times? Cultivated twice, one way, and hoed twice.

Cost of cultivation, including weeding and thinning? Three dollars.

Time and manner of harvesting? Not harvested.

Cost of harvesting, including the storing and husking or threshing? Five dollars per half acre.

Amount of straw, stover or other product? Eleven dollars per acre.

DARWIN P. KEYES, *for the Committee.*

WORCESTER NORTH.

From the Report of the Committee.

The corn of Joseph Goodrich was harvested September 6, twenty-three hills to the square rod, and the weight of ears was $40\frac{1}{2}$ pounds. November 6, the ears weighed $30\frac{7}{8}$ pounds; shrinkage $9\frac{7}{8}$ pounds, shelled corn $24\frac{3}{4}$ pounds, cobs $6\frac{1}{8}$ pounds. This would give on an acre, on the cob 4,940 pounds, shelled corn 3,960 pounds, cob 980 pounds; and would give $70\frac{5}{7}$ bushels to the acre.

The corn of Cyrus Kilburn was harvested September 6, thirty-three hills to the square rod, and the weight of ears was $40\frac{1}{2}$ pounds. November 6, the ears weighed $26\frac{5}{8}$ pounds; shrinkage $13\frac{7}{8}$ pounds, shelled corn 20 pounds, cobs $6\frac{5}{8}$ pounds. This would give on an acre, on the cob 4,260 pounds, shelled corn 3,200 pounds, cobs 1,060 pounds, and would give $57\frac{1}{7}$ bushels to the acre. This falls below the society's standard of weight, to entitle the competitor to a premium. This field suffered in two ways: first, by being too *thick* both in the row and in the hill; and, in the second place, from the drouth, it did not fill out well; it was very loose upon the ear, consequently it was light.

The corn of Edwin D. Works was harvested September 26, twenty-three hills to the square rod, and the weight of ears was $37\frac{3}{4}$ pounds. November 6, the ears weighed $32\frac{1}{8}$ pounds; shrinkage $5\frac{5}{8}$ pounds, shelled corn $24\frac{1}{4}$ pounds, cobs $7\frac{7}{8}$ pounds. This would give on an acre, on the cob 5,140 pounds, shelled corn 3,880 pounds, cobs 1,260 pounds, and would give $69\frac{2}{7}$ bushels to the acre.

The committee venture to offer a few suggestions on the cultivation of grain, not because they are new, but to stir up the minds of agriculturists by way of remembrance.

And the first thing to be done, to insure success, is to thoroughly prepare the ground by ploughing, harrowing and removing stones, so that its surface, to the depth of six or eight inches, may be made fine, that the roots of the young plants may easily and readily find food from which to grow. The next thing is to apply the manure in such a way that the growing crop can appropriate it to its own increase.

Distance of hills is another subject on which there is a diversity of opinion and practice, and this, to a considerable extent, must be regulated by the condition and location of the land, the kind of seed planted, and such other considerations as will occur to the mind of every practical farmer. A side hill would require more distance than an even surface, and one where there were stones and coarse sods more than where the surface was well pulverized. From three and one-half to four feet each way is a proper distance where the land is capable of being cultivated both ways; if not, the rows should be wider one way and closer the other, and should be so close as to contain from twenty to twenty-five hills to the square rod.

As to distance of seed in the hills there is also a diversity of practice. It should be planted close in the hills for the following reasons: 1st. Because it will stand stronger and suffer less from the winds and rains. 2d. Because the rows may be equally near and give six or eight inches more space to work. 3d. Because it is more easily cleared of weeds, and there is less danger of breaking it down when bringing up the fresh dirt around it. 4th. Because when ready for harvesting, a hill can be cut at a single stroke of the cutter or sickle, when, if scattered, a stroke would be necessary for each stalk. Number of kernels in the hill. To guard against depredations by worms and imperfect seed, there should be from five to eight kernels put in each hill, to remain until after the hoeing, but, before the second hoeing, the number of stalks should be reduced to four. It is better to have but three than to have more than four. In cultivating a field of corn the object should be to keep the surface as even as possible, as the earth is worth more to the growing crop to remain in the rows for the roots to work in than to be drawn up around the stalks. And it will stand the drough better and be firmer in the hills.

A clean culture is also necessary. The surface should be kept constantly light by the plough, harrow, horse hoe, or cultivator. No weeds or grass should be allowed to grow with corn, as they consume a part of the food designed for the corn, and thus check its growth and productiveness, as well as that of succeeding crops.

In reading the report of the Secretary of the State Board of Agriculture, of a discussion by that body, on the subject of raising corn, I was very much surprised at the opinion expressed by Mr. Grout, (a member of the Board,) relating to the depth to which corn roots extend below the surface. The remark to which I refer is on the sixty-second page of the "Agriculture of Massachusetts" for 1864, where he says: "I have examined that matter myself, and I have found the roots about two inches under the surface. They do not run to a very great depth."

My belief was that they extended much deeper, and to satisfy my own curiosity in the matter, *I also have examined it* to some extent.

While ploughing a few days since, where my corn grew the present year, I found corn roots, distinctly discernible by the naked eye, at the depth of a foot, and the roots were to be seen in every particle of soil as deep as I could plough, and I am confirmed in the belief that the roots of corn will *penetrate as deep* as you will loosen the earth, and place manure for them to feed upon.

There are many subjects connected with the raising and securing a field of corn, which the committee do not propose to enlarge upon at this time, such as the best kinds of manure, quantity, time and manner of application, the right time and the best manner of putting the seed into the ground, the most economical method of harvesting, whether by cutting the stalks in the usual manner, or by cutting at the ground and stooking. These questions, and such as these, are capable of almost indefinite enlargement. If, by anything suggested in this report, any *young farmer* or *old one*, should be led to a wiser expenditure of labor, or a richer harvest than heretofore, the committee will feel amply rewarded.

SOLON CARTER, *Chairman.*

Statement of Joseph Goodrich.

CORN.—The soil on which I raised my corn is rough clay loam. In 1863 the land was pastured. In 1865 I raised corn, using fifteen loads compost from the barn cellar.

For the present crop, I ploughed in April, from six to eight inches deep, furrowed with plough, one way, four feet apart, putting a small shovelful of cellar compost in each hill. I planted the first week in May, in rows, one way, about three feet apart, with seven quarts of seed, (called Carter corn,) to the acre. The first week of September the stalks were cut, and the corn harvested the third week, having two and a quarter tons of stover.

Cost of seed and planting,	$3 00
ploughing and other preparations,	9 00
manure, fifteen loads,	25 00
cultivating twice, with ploughs,	10 00
plaster applied at hoeing,	2 00
harvesting,	10 00
	$59 00

Statement of Edwin D. Work.

Corn.—The soil is sandy loam. Had oats on the same field in 1863, putting on about eight loads of manure. In 1864 had a cross of sorrel with a very little clover; no manure used. For the present crop, I ploughed over, the 23d and 24th of May, seven inches deep, harrowed with a cultivator harrow. I applied twenty-five loads manure, spreading a part and putting the remainder in the hill; also applied fourteen bushels of ashes.

Planted the 26th of May, by hand, common eight-rowed corn. Cultivated twice with a common cultivator. Value of stover, $10. Harvested the middle of October.

Cost of seed and planting,	$5 50
ploughing and other preparations,	5 00
manure,	50 00
weeding and hoeing,	8 00
harvesting,	8 00
	$76 50

Housatonic.

From the Report of the Committee.

The Committee on Fall Crops in presenting their report, desire to express their satisfaction at the good degree of interest manifested in the cultivation of the crops to which their attention was called. The fields examined by your committee show great care, not only in their culture, but in adapting their crops to the variety of soil to which they are suited. Perhaps in no section of the country can a greater variety of crops be successfully cultivated than is embraced within the limits of this society. Your committee were highly gratified in noticing the improved condition of the farms, the many pieces of reclaimed lands, the improved modes of cultivating the crops, the great improvement made in the implements used in cultivating the land, and in the spirit of emulation manifest in producing the greatest results with the least possible cost of labor and expense. Your committee in examining the crops have not only endeavored to ascertain the amount of the crop, but the *particular kind and quality of the crop*, as also the mode and cost of cultivation—average rods (when it was practicable to do so,) how harvested and accurately weighed or measured. How much any of these crops may shrink, (especially corn,) is not given your committee to decide. For ourselves, we believe the shrinkage is much larger than is generally supposed. The raising of sowed corn for feeding, while green, is of growing importance, and is engaging the attention of the farmers generally. Your committee were called to the examination of two sown crops, and noticed particularly the variety of corn used for this purpose, among which was the Sweet Evergreen, which in the opinion of your committee is the best suited to this purpose, and we would recommend the raising of this, over all other kinds of corn, for this purpose.

H. Garfield, *Chairman.*

BRISTOL.

Statement of George R. Leonard.

Barley.—The crop of 1863 was grass. No manure was used. The crop of 1864 was corn. Used 25 loads stable manure, of 30 bushels in a load, 1 barrel poudrette, 104 lbs. superphosphate of lime. The soil is a clayey loam. Ploughed once, April 18th, 9 inches deep. No other preparation. Cost of ploughing, $4. Used 25 loads of manure, spread and ploughed in. Cost of manure, $31. Sowed April 19th, harrowed three times and rolled once; used about 4 bushels of barley. Cost of seed and planting, $10. No cultivation. Harvested July 10th, cut, dried well, and stored. Cost of harvesting, $15. Amount of other products, 4 tons of straw, $48.

George R. Leonard.

Norton, September, 1865.

ROOT CROPS.

ESSEX.

From the Report of the Committee.

The field of turnips offered for premium by Mr. Hiram A. Stiles, of Middleton, lies east of Beach Brook, near the Essex Railway. The soil in some parts is of a light, gravelly texture, and in others is a fine loam. The turnips, planted in drills, had been somewhat affected by mildew, but were generally looking very well. The field was not kept as clean from weeds as some of the committee thought consistent with good husbandry, but as Mr. Stiles manifested considerable regret that the weeds had not been rooted from among the "roots" to which he had called the official attention of so august a body as this committee, it is deemed prudent to say nothing whatever about them. Mr. Stiles's facilities for preparing his turnips for market are worthy of commendation. Beach Brook, whose tortuous course is supposed by some to have been marked out at the subsidence of the deluge by a bewildered sea-serpent in search of the Atlantic, runs between the turnip field and the residence of Mr. S. Over this brook he has erected a shed with all the "modern improvements" for washing, trimming and packing his crop for market. From the field the turnips are carted to this shed where with the aid of a brush and an abundance of water, all adhering matter is quickly brushed from the tubers, a clip from a knife severs the leaves and they are ready for tying into bunches for market. As Mr. S. is the only applicant for a premium on English turnips the committee have had no means of comparing his with the crops of others, who, it may be, had better crops; but it is *presumed* that no one had or they would have "done themselves the honor" of calling the attention of your "discriminating and intelligent" committee to the same. The committee therefore recommend that Mr. Stiles be awarded the highest premium for this product. Mr. Stiles's statement is herewith enclosed, to which, for details, the committee refer.

On the same day of visiting Mr. Stiles's place the committee responded to a call from Mr. Moody, of the Burley farm, Danvers, to examine a crop of potatoes and Swedish or ruta-

The Crimean armies had to encounter the plague again, for the cattle upon the steppes were dying in myriads, but it did not then spread over the west for the reason that no large English or French armies moved by land with their immense trains of supplies.

The disease, however, got into the French camps, and afterwards into the English camps. The veterinary surgeons endeavored to prevent it; but they had to use more or less of the meat which was thus infected. It is a general fact that whenever large armies have moved over Europe that disease has followed. After the disease had been raging in England for some time last summer, the officials of the Russian Government endeavored to make it appear that it had not existed in Russia since 1859. But the exportation of cattle from Russia is immense, and of course it was desirable to make it appear that it could not have come from Russia to England. But you have seen reports from our Minister at St. Petersburg and our Consul at Warsaw; and we know that last year, 1864, more than one hundred and sixty-four thousand head of cattle were attacked with this disease, in Russia alone, of which one hundred and four thousand died. So that there can be no question that the disease has existed in Russia, more or less, for many years, and is liable to break out there at any time, because it is indigenous there, and in some parts of Asia, which is not the case in Western Europe, or in this country.

There is one feature of the disease in which, probably, it has the advantage of the pleuro-pneumonia, and that is, in the more complete recovery of some portion of the animals attacked. There is no reason to suppose an animal that did recover would not be as sound as ever. Not so with one suffering a severe attack of pleuro-pneumonia. The lung tissue having once been destroyed to a greater or less extent, no effort of nature can restore it so that the animal can be regarded as sound. It may so far recover as to take on flesh and fat, but no farmer would ever want to own such an animal, much less to breed from it.

In the cattle plague, in other words, no vital organs are permanently destroyed so but that, in case the animal survived, it might not be considered as sound.

Leaving this particular disease, I wish to state that there was a wart case brought to my knowledge the other day, and I should like to know how it can be cured. A man has a heifer almost covered with warts. If any one has had experience in curing them I shall like to know how it can be done.

Mr. STEDMAN, being asked to give his views on that subject, said: I should not be able to give any light on that point. I keep a bottle of oil of spike-root which I use. But I have never had but little experience in diseases of cattle. If my cattle have warts I let them alone and they come off themselves. I think our cows are more liable to diseases than other stock, some arising from difficulties connected with parturition. I have not been troubled, however, with such diseases as have prevailed in some places, and as they have had in the State of New York, where they lose their calves by shrinking or abortion. I have rarely had anything of the kind, and when I do, and suspect a repetition of it, I slaughter the animal.

With regard to the cattle plague, I was very glad to hear the remarks of the Secretary. I saw an article in the "New York Independent," by Hon. Amasa Walker, in which he seemed to speak of the cattle plague as identical with the pleuro-pneumonia. I thought he was mistaken.

Mr. FLINT.—It was certainly a mistake. There is scarcely any resemblance between the diseases.

Mr. WHITING GATES, of Leominster.—When warts come on young stock, they will generally go off the third year, as I have observed; and I have heard others remark the same thing. I know of a case where a man bought a valuable cow at a low price, because she had warts. He cured her by washing the warts in copperas water, dissolved in an iron kettle. The cow had several large warts on the lower part of the abdomen.

Mr. C. O. PERKINS, of Becket.—I have had some experience in curing warts. Sometimes they are of a kind called blood-warts, and at others they are more of a scurvy nature. I have seen warts as large as a two-quart measure. There are three or four ways in which I get rid of them. One is to cord them tightly with a small string, so as to stop the circulation of the blood. Sometimes, when they have only a small attachment to the body, I pull them off. They do not bleed enough to do any harm. I have never seen an animal that had so many as the one described by the Secretary. Fish oil will sometimes destroy rivers and the result is a fertile soil. Analysis finds nothing in coal ashes. Apply these ashes to your trees and mix them with the earth, and the brute matter expresses its thankfulness in a more luxuriant foliage and a greater burden of fruit. On every hand the farmer is admonished by nature to mix, mix, mix! Now, in the case of the farmer to whom we have alluded, were he to adopt the plan of employing a man with a horse and cart to draw in absorbent matter to mix thoroughly with his manure he would never after have occasion to complain that he was short of manure even though he might cultivate double the land he now does.

J. F. C. Hayes, *Chairman.*

Statement of Hiram A. Stiles.

The crop of 1863, on the land on which is the crop of turnips I now offer for premium, was one-half grass with no manure, the other half turnips, on which was applied four loads of manure made up of 125 pounds of Coe's superphosphate of lime and one barrel of fish guano. Quantity of land, two acres and sixty-nine rods.

The crop of 1864, on four-fifths of the land, was turnips—on the remainder grass. On the turnip land was applied nine loads of manure—125 pounds Coe's superphosphate of lime, 60 pounds Pacific guano and 250 pounds Rhoades' superphosphate. The nature of the soil is sandy loam and leachy.

For the crop of the present year I ploughed once from six to eight inches in depth, the grass land in March, and the old land in April, and harrowed twice with tooth harrow and once with bush. Cost of ploughing and preparation, $12.

I applied eleven loads of manure spread evenly on the surface and 300 pounds of Pacific guano, with 100 pounds of Rhoades' superphosphate and one barrel of poudrette. Value of manure, $50.

Sowed at different times, from March 28th to April 25th, in drills twenty inches apart, using one pound of seed of the strap leaf variety to the acre. Cost, $3.75.

Hoed twice the first time, weeding and thinning the plants, leaving them from six to nine inches apart. Cost, $35.

Harvested 30 bunches June 8th, and 3,300 bunches before July 4th, and the remainder during the month of July, putting six in a bunch, after trimming and washing. Cost, $140.

Whole number of bunches sold,		8,000
Cash received,		$512 08

Recapitulation.

Ploughing, etc., cost,	$12 00	
Manure,	50 00	
Sowing and seed,	3 75	
Hoeing and weeding,	35 00	
Harvesting and bunching,	140 00	
		240 75
Profit,		$271 33

The earlier part of the season has been favorable to the growth of English turnips, producing early those of large size and of excellent quality. It is evident, however, that in instances of this kind, turnips are more liable to be checked in their growth by blight followed by extreme heat, which has been the case the present season to a considerable degree and at an earlier period than usual. As the turnip is easily affected by climate, soil and mode of culture, there are methods, when adopted, which, in a measure, will tend to prevent the injurious effects of blight and hot weather. First, early sowing tends to prevent the ravages of the turnip-fly; second, it may mature for the market before the 1st of July, before which time the blight or *very* warm weather seldom occurs; 3d, manure should not be too forcing in its nature, creating large tops and a consequent *reaction* in very warm and dry weather; 4th, sufficient space should be given for each plant to thrive and mature early; 5th, weeds should never be removed from the crop, (if early,) when springing up after the 15th of June, as they shade and *protect* rather than injure the turnip. For the last eight or ten years I have adhered to these rules, generally with gratifying results.

MIDDLETON, October, 1865.

Statement of David Stiles.

The quantity of land covered by the crop was 84½ rods. The crop of 1863 on one-half the land was grass; on the other part potatoes, on which a small shovelful of stable manure in each hill was used.

The crop of 1864 was the same, using about one-half a cord of stable manure, applied in the same way.

The soil is a light muck, from six to twelve feet deep. It was ploughed in the early spring of 1865, and again, (just before planting,) eight inches deep, and furrowed deep to receive the manure. Cost of ploughing, etc., $8.

About one cord of manure was applied in the hill. Value, $12.

Planted June 4th, in hills three by four feet apart, with 2½ bushels Scotch apple potatoes. Cost of seed and planting, $8.

Cultivated by ploughing and hoeing in the usual way, using rackets on the feet of the horse to prevent him from sinking in the meadow. Cost of cultivation, $7.

Harvested September 28th and 29th, by digging with a manure fork those that failed to come out with the vines. Cost, $10.

Product:

600 pounds small potatoes,	$6 00	
108⅙ bushels large "	108 16	
		$114 16
Cost of manure, labor, etc., as above,	$45 00	
Interest on land,	3 00	
		48 00
Profit,		$66 16

After experimenting about nine years with some seventeen different varieties of potatoes, I have come to the conclusion that the Scotch apple is better adapted to these muck lands than any other, and will produce a greater yield in such localities than any other variety, Californians not excepted; and as the soil seems suited to the first named variety, its good flavor is actually increased. No other potato is chosen before it for the table by those who know potatoes. This variety has not been affected with the rot during all the time before named, provided the muck was not less than about five feet deep where they were planted. All the other varieties have rotted more or less. No potato, I think, can be successfully raised in a shallow, cold, mud soil ; it must be deep, light and porous.

From year to year I have planted the small potatoes, two in a hill. But where the lands were dry, or in poor condition, two of the largest size would insure a more vigorous vine and guard against drought. Two potatoes in a hill, about a foot apart, gives you something like two hills in one without additional expense in cultivating.

Had this ground been planted a week or ten days sooner, and had seasonable rains occurred, the crop would probably have been larger. Wet seasons have produced the largest crops.

These potatoes were not planted with a view to offer the crop for premium, otherwise I should have planted them a little nearer together. Some of the rows actually measured five by six feet apart, and would average more than three by four feet apart. Yet the vines nearly met.

My experience has taught me that nothing is gained by crowding a crop ; it causes a greater draft upon the land and additional expense in cultivating.

When the muck is deep no underdraining is needed. Ditches at the distance of six or eight rods will take all the surplus water.

The cost of cultivating and harvesting on these lands is far less than upon the upland. Though rackets must be used on the horse's feet, yet few, if any, would refuse to work in them, and therefore but little trouble is experienced from this source.

The planting was done in one day, and the second time hoeing in one day, by myself ; and the first time hoeing was only about a good day's work, making three in all. With the aid of two boys of the age of fourteen years, I gathered, assorted and put in the cellar, fifty bushels in a day of nine hours.

I do not claim that this land is better than hundreds of acres in our county, now producing nothing but brakes and bushes, which would furnish food for vegetables of various kinds, and particularly the potato, long after the Western prairies have failed, by drawing from them more than is returned, while these bogs of ten feet deep—the accumulation of ages—must outlast the richest soil on the globe.

MIDDLETON, October, 1865.

WORCESTER NORTH.

Statement of D. H. Merriam.

Onions.—The ground selected for the onion field lies on River Street, in Fitchburg, about three feet above the Nashua River, and contains three acres. It has the appearance of having been, at some time, overflowed by the river. It is nearly level, and the soil is a sandy loam from one to three feet deep. It had been in grass for eight years, since it had been ploughed, and nothing put on it during that time except one hundred and fifty bushels of ashes.

In the fall of 1864, the Worcester North Agricultural Society ploughed about two-thirds of the ground from six to twelve inches deep, and the remainder was ploughed six inches deep, and late in December I put on to one acre fourteen cords of slaughter-house and common barn manure, and left it in heaps of one cartload in a place, and in March, 1865, I put on to the other two acres twenty-six cords of mixed manure, consisting of horse, hog, slaughter-house and cow manure, of about equal parts. In the last week in March I spread the manure over the entire lot and harrowed the ground, both ways, with a cultivator harrow, which moved the ground about three inches deep, and covered the manure. I then picked off all the stone found upon the land, and removed all sods that had been disturbed by the harrowing, and placed them in rows about forty feet apart, and running from north to south. These rows of sods and coarse manure, that was unrotted, occupied about five feet in width, and in all about one-half of an acre of land. Upon these rows of sods and waste manure, I raised 1,250 cabbages, 120 bushels of tomatoes and 600 pounds of squashes.

I raked the ground thoroughly with wood and iron rakes, and levelled the same, as nearly as could be, for the onion beds, and on the 14th day of April, I sowed one acre of the ground to onions, and in one week from that time, sowed one acre more, and on the 25th day of April, I sowed the remainder, using in all eighteen and one-half pounds of seed. I was twelve hours in sowing the seed on the three acres, in rows one foot apart, with one of Harrington's seed-sowers, which put the seed in about one-half an inch and rolled the ground by a roller attached to the same. I weeded the onions three times; once in May, once in June, and once in July. The first weeding was commenced as soon as the onions were of sufficient height to be plainly seen. They were much the best on the two acres where the manure was carried on to the field in the spring, and each of these two acres yielded at least one-third more onions than the one where the manure was carried out in the fall, and lay in heaps over winter; and the acre sowed first yielded the best of the three. I hired all the labor done on the land, except the sowing of the onion seed, which I did myself. I paid for labor in the months of April and May, $1.75 per day, and for the remainder of the season, $1.50 per day, for men, and the same for a horse, in preparing the ground. The onions were ripe and harvested the last of September.

Amount and Value of Crop.

1,050 bushels, 1st quality of onions,	$1,050 00
300 " 2d " "	150 00
120 " tomatoes,	110 00
1,250 cabbages,	120 00
600 lbs. squashes,	18 00
Total value of crop,	$1,448 00

Cost of Raising the Crop.

40 cords of manure, at $5 per cord,	$200 00	
Labor of men and teams,	830 65	
18½ lbs. onion seed,	89 12	
Cabbage seed,	50	
Interest on land at $200 per acre,	36 00	
		1,156 27
Net profits,		$291 73

In the above statement no credit is given for the improved condition of the land, which is an item of considerable importance, as only a small portion of the manure is expended, and the land is cleared from stone and foul growth of weeds and roots, which will not impede the cultivation another year. I estimate the improvement of the land at $150, which, added to the value of the crop over its cost, makes a gain of $441.73.

D. H. Merriam.

Fitchburg, November 27, 1865.

HIGHLAND.

Statement of M. J. Smith.

CARROTS.—Crop of 1863, grass and fodder corn; used sheep manure, six loads of twenty-two bushels each. Crop of 1864, grass and carrots; used sheep manure, six loads of twenty-two bushels each. 1865, ploughed three times, eight inches deep; dragged twice and ridged at a cost of $4; applied nine loads of manure, spread and ploughed in; sowed in drills June 1st. Cost of sowing and one-half pound of seed, $2.50; hoed three times and thinned at a cost of $10; harvested November 1st to November 12th. Cost of harvesting, $6; tops equal to the value of harvesting. M. J. SMITH, *Competitor.*

From personal observation, I hereby certify that the above answers are true. From actual measurement, I hereby certify that the land the above crop of carrots covered contained 40 rods and no more. I hereby certify that the weight of the above crop, as ascertained by me, on the 12th day of November was 10,000 pounds. SAMUEL SMITH, *Committee.*

PLYMOUTH.

A PRIZE ESSAY ON ROOT CULTURE.

BY EDWARD A. SAMUELS.

Root culture comprehends the cultivation of all those plants whose roots are valuable for food; the different varieties of mangold wurzel, ruta-baga or Swedish turnip, white turnip, carrot, parsnip, potato, artichoke and onion, are included under this head, all of which possess nutritive qualities, some to an extraordinary degree. The three latter-named roots are not generally spoken of in connection with root culture, as field crops for stock food, and they will therefore not be treated of otherwise than incidentally, in the present paper.

Perhaps among all the roots cultivated for stock feeding, the mangolds occupy the most eminent position, both on account of their enormous yield, and their value for stock food. There are six well established varieties, all of which have marked characteristics. They are called Orange Globe, Deep Orange Globe, Long Red, Long Yellow, Red Globe and Sugar Beet. Of these the different Globes are preferable for light soils, and the others for deep, heavy land.

Preparation of Land.

Land intended for mangolds requires thorough draining, deep ploughing, and thorough harrowing. An autumn ploughing and another in the spring is very desirable, and when the manure is spread upon the surface, it should be thoroughly incorporated with the soil. About six cords of barnyard manure thus applied on the surface, and about the same amount in the drills, is a fair allowance for this root on soils of average fertility. The land having been ploughed and harrowed, drills should be opened about twenty-four inches apart. If the land is very heavy, some sand should be thrown in the bottom of the drill before the manure is applied. This should be deposited evenly, and thoroughly pulverized, and covered over, at the depth of two or three inches, with the soil. The ground is now ready for the seed, about five pounds to the acre. This should be steeped in dilute liquid manure two or three days previous to sowing, to promote germination. It is sown both by machine and hand. It should be deposited evenly in the drills, at the distance of not less than an inch apart, and covered lightly with the soil. A good method is described as follows:

"Great care must be taken that the seed of the mangold wurzel is not buried too deep, or it will not vegetate. To insure, therefore, a proper depth, I have been in the habit of using an iron wheel, round the outer circumference of which, iron points project, broad at the base and tapering towards the point, about 2½ inches long. This is wheeled upon the top of the ridge, the man walking in the furrow, and thus holes are formed which can never run into the excess of great depth, and into which the seeds are deposited by women or boys following the wheel. The roller follows, and thus the sowing terminates."

Culture.

As soon as the young plants have become well set, and the leaves, from three to four, well put out, should come the first thinning. This should be conducted uniformly, yet not severely, as many of the remaining plants are liable to receive injury, or grow puny or sickly. The plants should be left standing, at this thinning, certainly five inches apart, and even less, if there is any doubt as to future success. At this time occurs the first hoeing and hand weeding. This should be thorough, as on it depends, in a great measure, the success of the crop.

At the second thinning, about three or four weeks from the first, all strong plants growing at a nearer distance than twelve or fourteen inches from each other, should be removed, and in case there are any blanks in the rows, caused by the seed not germinating, or by death of the plants, white turnip seed, or even Swede, may be sown in the spaces, if the season is not too far advanced. These may be thinned if occasion requires, at the time of the third weeding.

The second thinning of the mangolds should be attended by a careful hoeing and hand weeding, and if the ground is very weedy, a third hoeing is necessary.

These rules regarding weeding in mangold culture, as in the cultivation of all other roots, should be rigidly observed. The amount of nourishment robbed from the plants by a host of worse than worthless weeds is incalculable, and the thrifty farmer should lose no opportunity of destroying them.

Harvesting.

About the first week in October the mangold is ready for harvesting. This should always be done in dry weather. After pulling and piling the plants in heaps at convenient distances apart, (taking care that not more than enough is pulled in the morning, than can be handled and housed on the same day,) the tops and tap-roots, and all sand and earth removed in a careful manner, that is, without wounding the root itself, the bulbs may be left to dry in the sun for a few hours. They should be housed on the same day on which they are pulled, certainly if there is danger of frost in the night, as they are much more liable to suffer from its attacks when deprived of their leaves out of the ground, than when protected by them in it. In storing mangolds, care should be observed in selecting a cool, dry locality; and if put in bins no greater depth than four or five feet is advisable. An atmosphere that is warm causes them to leaf, and if they are once frozen, they immediately begin to decay. The leaves are very valuable as food for milch cows, in increasing their flow of milk to a surprising degree. Care should be taken that the dirt and sand be removed from them before given to cattle, as there has been considerable complaint among farmers, of the injurious effects of them on the enamel of the teeth of the animals, causing them to wear off and decay. The following table of a series of experiments conducted at the Albert Institution, in Dublin, Ireland, shows the value of the leaves of this root:

No.	Date of Experiment.	Kind of Food.	Butter produced by 40 quarts milk.
1	May 4, 1857, .	Italian rye grass, alone, . .	3 lbs., 5 oz.
2	Sept. 5, 1857, .	Italian rye grass and pasture, .	3 " 13 "
3	Sept. 28, 1857, .	Mangold leaves and pasture, .	3 " 14 "
4	Oct. 6, 1857, .	Mangold leaves alone, . .	4 "

Yield.

The yield of this root, of course, varies with the fertility of the soil, and the favorableness of the season; but for a fair average yield, everything considered, about one thousand bushels to the acre may be anticipated. Dr. Loring cultivated sixteen hundred bushels to the acre, from a mixture of long red and yellow globe seed, but such a yield is extraordinary, much beyond the average. The following table of average yields of the different varieties, as observed in England, falls considerably below the figure. The ton measures about thirty-four bushels:

Variety of Mangold Wurzel.	Produce per Statute* Acre.
Orange globe, ...	32 tons, 6 cwt.
Deep orange globe, ...	29 " 18 "
Long red, ...	28 " 15 "
Long yellow, ...	28 " 14 "
Red globe, ...	26 " 14 "
Sugar beet, ...	30 " 12 "

* Containing 4,840 square yards.

This enormous yield, when we consider the amount of nutriment it affords from the root alone, without taking into consideration that from the leaves, appears truly enormous, and establishes this at once as one of the most profitable roots for cultivation.

Analyses.

The following table of analyses represents the comparative nutritive qualities of the different varieties, as given by Prof. Johnston.

CONSTITUENTS.	Long Red.	Red Globe.	Orange Globe.	Long Yellow.	Sugar Beet.
Water, ...	85.18	84.68	86.52	85.10	85.0
Gum,.	0.67	0.50	0.13	0.61	2.0
Sugar, ...	9.79	11.96	10.24	10.51	10.60
Caseine, (so called,) . . .	0.39	0.26	0.33	0.32	0.09
Albumen, ...	0.09	0.18	0.03	0.11	–
Mineral matter, ...	3.08	3.31	2.45	3.35	2.31
Total nutritive matter in 100 parts,	10.94	12.90	10.73	11.55	12.69

It will be observed that nothing is allowed in the above table for water as a nutritive element; this, as is well known, is nutritive to a certain extent, especially when found in the different roots. We find that the average amount of nutrition furnished by the different mangolds is about twelve per cent. of the entire bulk; consequently the yield of an acre of mangolds being one thousand bushels, equal in weight to about thirty tons, the amount of nutrition actually afforded is about three and two-fifths tons, an amount exceedingly large and equalled by few other crops.

Swedish Turnip—Ruta-Baga.

Although the mangold wurzel undoubtedly is one of the most valuable of all the roots cultivated for food for farm-stock, the Swedish turnip, for general use, both for stock and domestic food and for the market, certainly occupies as high a position. It is a hardy plant, requires not the best land on the farm, and needs no extravagant manuring, about five cords to the acre being in most cases amply sufficient.

Preparation of Land.

Swedes seem to prefer a sandy or gravelly loam, free from moisture and in a warm locality; deep rich soils are unfavorable to the growth of sound, full, well-shaped roots, as they are apt in such localities to "run to top, root and stalk." Having ploughed and harrowed the land, and furrowed it into drills at the distance of about thirty inches apart, the manure should be distributed in them smoothly and well pulverized. It is important, *always*, in the application of manure, that care is taken to have it covered with earth at the earliest possible moment; the amount of ammonia that is dissipated through negligence of this important point is very great, frequently a large percentage of the whole strength. The drills may be covered with the hoe, or, still better, with the plough. The ridge thus thrown up should be levelled off with the hoe, and the ground is then ready for the seed.

Says Dr. Loring, in an admirable report on root culture, with reference to sowing ruta-bagas: "The time of sowing the seeds must vary with the climate. On Long Island, Mr. Cobbett's trials of one year led him to prefer the 26th of June, but in our own county* I would not pass the middle of the month. Indeed, I think it expedient (in order to ascertain the fittest time,) to commence sowing the seed as soon as the ground can be prepared, after the planting of Indian corn, and to continue in small plots, weekly, until the middle of June." The amount of seed required to sow an acre is about two and a half pounds; this should be sown with a machine to receive the greatest uniformity; if sown with the hand, the seed should be covered with the rake to the depth of one-third or one-half inch. The most desirable variety is that known as Skirving's King of the Swedes, both for its great yield and the superior quality of the root.

Culture.

The same remarks apply to this root as to the mangolds, regarding weeding, thinning, &c. In case there are any blanks in the rows owing to non-generation of seed, or accident to the young plant, they may be filled by transplanting; this should be performed in damp or cloudy weather, and if moderate care is observed, success is almost certain. The land should be kept loose on the surface and free from weeds, and in case of very wet weather, it is well to run a plough between the rows to secure a perfect drainage.

* Essex.

Harvesting.

The ruta-baga is ready for harvesting, in New England, by the 20th of October; but, in case other work drives, the roots may remain in the ground until the first week in November, if the weather is not exceedingly cold for the season. After pulling and topping in the same manner as the mangolds, already described, the roots should be put in bins, in a cool, dry locality, and packed in a depth not more than three feet. The following method of storing, taken from the "Farmer's Encyclopædia," is desirable when storage is scarce, and the roots are not to be used immediately: "Select a convenient and dry situation, and pack the roots carefully with their crowns outside, in a row about six feet wide at the bottom, and terminating in a narrow ridge at the top; then dig a trench, commencing immediately at the edge of the roots two feet wide and one deep, turning the mould from the heap; thatch the latter carefully with straw, commencing in the trench, so that all the rain may drain off the heap into it. The clamp may be left two or three weeks in this state, that the evaporation from the roots may escape; the mould already taken out of the trench is then to be laid on the straw, commencing at the bottom of the thatch, and covering the heap twelve inches thick throughout, finishing with a sharp edge. Half the trench originally made, will, of course, by this plan be filled up with straw and mould; the other half will remain as a channel for the water falling off the heap; and, as sufficient mould will not have been raised from the original excavation, it will be advisable, in procuring more, to make the channel left round the heap a few inches deeper, as well as wider. The leaves, like those of the mangolds, are exceedingly nutritive, and, when given to milch cows, cause a greatly increased flow of rich milk. Care should be taken that all dirt is shaken from them before giving to the animals."

Yield.

This varies in different localities; as high as one thousand bushels have been raised to the acre; probably a fair average yield is about seven hundred bushels to the acre, each bushel weighing about sixty pounds.

The analysis of the ruta-baga, shows that it is less nutritive than the different varieties of mangold wurzel, and observation and experiment show conclusively that such is the fact. The average analysis, as given by different authors, both in this country and Europe, is as follows:—

Water,	86.60
Mucilage or Starch,	6.70
Sugar,	3.10
Albumen,	1.10
Mineral matter,	2.50

Total amount of nutritive matter in 100 parts, 10.90, or nearly 11 per cent.

The yield of an acre being 700 bushels, the total amount of nutritive matter afforded would be about two tons. Lord Spencer, in an exceedingly interesting experiment, to test the relative values of the mangolds and Swedes for feeding purposes, came to the following results. He found, after feeding one of two steers on mangolds, and the other on Swedes, that they gained at the rate of forty-eight and one-quarter pounds for every ton of Swedes consumed, and sixty-five and one-half pounds for every ton of mangold wurzel. He then changed the food of the animals, giving to the one that had had Swedes, mangolds, and to the other Swedes. He found that they then gained at the rate of only thirty-six and three-quarters pounds for every ton of mangolds consumed, and fifteen and one-half pounds for every ton of Swedes. These experiments were conducted carefully, and prove conclusively the relative values of the roots and the effects of changing the diet of animals from a more nutritive food to a less. Equal quantities of hay were consumed in both cases.

Turnip.

The importance of turnip culture is hardly as yet appreciated in this country at its true value. In Great Britain, much attention is paid to it, and the farmer would be at a loss to manage his stock without the assistance of this valuable root. Like the Swedish turnip, this root succeeds best in light, warm soils, running to long necks and heavy, luxuriant tops in richer lands.

Preparation of Land.

When turnips are to be sown on newly broken green sward, the land should be manured with from four to six cords of barnyard manure, or its equivalent, to the acre, and ploughed about the middle of June, and thoroughly harrowed and broken. If the turnips are to be sown in drills, mark out with a furrowing plough, drills at the distance of about eighteen inches apart, and apply to the bottom of these a light amount of barnyard manure, from three to four cords to the acre. Cover this with the hoe or plough, and after flattening the drill with the hoe, the seed may be sown. This should be sown in the same manner as the Swedish turnip, and with the same amount of seed. On old lands, turnips succeed best if the manure is all placed in the drills, and in all cases, well rotted manure should be employed. In the foregoing directions nothing but barnyard manure has been recommended, it being with all writers and experimenters the standard of manures; but in some cases with the turnip, as with other crops, other fertilizers are nearly or quite as valuable, and turnips have been found to succeed with phosphate of lime and guano, as well as with the best barnyard manure. Dr. Loring says: "It is seldom that cow manure alone attains a degree of warmth sufficient for this crop. It is well, therefore, to combine it with a liberal supply of well rotted horse manure. A compost of one-third muck, one-third cow manure, and one-third horse manure, well mixed and thoroughly decomposed, is as good an application for turnips as can be found. About six cords of this compost spread upon the acre and well harrowed in will make a good bed for the crop. The addition of half a ton of bone manure to the acre to the compost heap before it is applied, will vastly improve the mixture.

Usually, in New England, the turnip crop is depended on only in succeeding other earlier crops in the same season. The usual custom is, as soon as the first crop has been secured, to plough the land after an application of from three to five cords of manure to the acre, (sometimes less,) harrow it, and sow the seed, broadcast. This method, although remunerative, is not nearly so profitable as that of sowing in drills, the favorite method of culture in the old country.

Culture.

When sown in drills, turnips require a thorough weeding and thinning at about three weeks' growth; no two plants should remain nearer each other than five inches; in another three weeks, they require another weeding and hoeing, and if the soil is heavy, the plough should be run between the drills; after this, they remain untouched until

Harvesting.

This does not occur until late in the autumn, or until the arrival of pretty cold weather. The roots are pulled in dry weather, and treated in a similar manner to the Swedes, already described, great care being taken, in storing them, to place them in a situation where they will receive an equable, cool temperature, free from damp, and if possible light, as these exposures are liable to induce leafing and corkiness in the bulbs.

Perhaps none of the roots cultivated present such great variations in their yield as the turnip. Mill considers an average crop to be 11,664 roots per acre, (planted in drills,) which at five pounds each, would weigh 58,320 pounds, or 29½ tons. Other writers place the figures much higher, and many others lower. Of course, allowance must be made for fertility of soil and care in cultivation; but, everything averaged, the yield may be safely reckoned as about 25 tons per acre. "In rare cases it has risen as high as 60 tons per acre, and fallen so low as next to nothing; and in ordinary cases, it ranges throughout the greater part of the enormous interval between these extremes; and in average cases of good culture, at the commencement of rotations, or immediately after manurings, it may be set down at something between 28 and 32 tons per acre."

The analysis of the turnip shows that it possesses less nutritive matter than most of the other roots. The different varieties of course vary in their constituents; but the following is believed to be the average composition of the common varieties grown in this country:

Water, ...	90.5
Albumen and Caseine, ...	1.1
Sugar, ...	4.0

Gum,	1.5
Woody fibre,	2.4
Mineral matter,	0.5

Total amount of nutritive matter in 100 parts, 6.6, or in 25 tons, a large yield to an acre, $1\frac{9}{10}$ tons.

In the above percentage, of course, only the produce of the roots has been taken into consideration, and nothing has been allowed for the nutrition contained in the water of the root, which, as before remarked, possesses a considerable amount of nutriveness.

Carrot.

The cultivation of this root, the favorite in New England, is generally so well understood, that anything can hardly be added in the present paper, of value, concerning its culture. The great value of the root for stock, seems to be over-estimated, and when we take into consideration the amount of labor required in the cultivation, and the yield in comparison with some other roots, it is hardly to be wondered that its culture is already being superseded by that of other foods.

The carrot, as is well known, needs the deepest soils, and will not thrive unless they are warm, rich loams, at that.

Preparation of Land.

Ground intended for carrots should be ploughed twice; once at the earliest opportunity in the spring; the second time, to kill the weeds that have already sprouted. In fact, almost every operation in their cultivation is conducted with reference to the extermination of weeds, the growth of which constitutes one of the greatest difficulties attending their culture.

The land having been deeply ploughed and harrowed, and furrowed in drills, about 24 inches apart, the manure, from eight to ten cords of barn-yard compost, should be applied evenly at the bottom of the furrows, and covered lightly, either with the hoe or plough; the top of the ridges should be made even and regular, and the ground is ready for the seed. This should be of the previous year's growth. There are several kinds, each adapted to different soils. Those called horn carrots are best for shallow soils, and the long carrots are most desirable for deeper soils. In sowing by hand, care should be taken that the seeds are dropped uniformly; this is difficult, from their nature, because, being minute and light, and covered with a hairy down, they are liable to be dropped too closely, or in irregular bunches. In covering them, rake from the *outside* of the drill lightly towards the middle in which they are deposited, taking care that they are not covered at a greater depth than from three-fourths of an inch to an inch.

Culture.

As soon as the young plants have produced three or four leaves, four or five inches in length, they should be thinned out; this is when they are about six weeks in the ground. The plants should be removed when growing at a less distance than four inches apart, and at the same time they should be hoed and hand weeded, which operation should be repeated every three or four weeks, and even oftener if the soil is very weedy. A plough run between the drills once or twice during the season is desirable, keeping the earth loose and porous.

Harvesting.

This occurs about the close of October; the roots are first loosened in the earth by running a plough through one side of the drill, when they are easily removed with the hand or fork. In most localities the whole plant is piled in the field, allowed to remain through the greater part of the day, and then carted to the barn or shed, for topping at leisure. The leaves should be removed without wounding the root, and, after the dirt is shaken from them, are valuable for cattle and horses. The root itself should be treated in the same manner as the ruta-baga, already described. It is valuable for cattle, but is peculiarly desirable for horses' food, (for which purpose it is almost exclusively grown in England,) furnishing a good substitute for grain, and also acting sanatively on the general health of the animal.

Yield.

This varies considerably on different lands. As high as 850 bushels to the acre have been reported, and as low as 400 bushels. Probably about 700 bushels, weighing sixty pounds each, may be considered a large average yield. The analysis of the carrot is as follows:—

Water, ...	87.5
Albumen and Caseine, . . .	0.6
Sugar, ...	6.4
Fat, ...	0.2
Gum, ...	1.0
Woody fibre, ...	3.3
Mineral matter, ...	1.0

Total amount of nutritive matter in 100 parts, 8.2, or in a yield of 21 tons to the acre, $1\frac{7}{10}$ tons.

The above shows that for stock feeding alone, the carrot ranks lower than most other roots.

Parsnip.

Perhaps the culture of none of the roots is more neglected by the farmers of New England than that of the parsnip; and it is to be wondered at, considering the value of the root for yield and nutrition, and the labor required in its cultivation. The parsnip needs a deep soil, but will flourish on almost any quality of land.

Preparation of Land.

This should be deeply ploughed and harrowed, then furrowed out in drills twenty-four inches apart, and from seven to nine cords of well rotted barnyard manure applied evenly at the bottom of the furrows. This should be covered either with the plough or hoe, and the seed from three and one-half to four pounds to the acre, sown regularly, and covered lightly to the depth of an inch, or an inch and a half.

The whole subsequent culture of the plant is similar to that of the carrot, with this exception—the soil should be levelled, and if kept free from weeds for the first two months of its growth, unless the land is exceedingly weedy, will succeed in growing beyond them for the rest of the season. Thorough eradication of weeds is of course always to be secured, if possible, but if any of the roots are to be neglected in this respect, the parsnip is the one.

The roots may remain in the ground through the winter without injury. Indeed, in the opinion of many, they are more valuable for cattle in the spring, when left in the ground, than when pulled in the autumn and stored in cellars through the winter.

Yield.

The yield of this root, on the average, is about 600 bushels to the acre, each bushel weighing about fifty pounds. The analysis is as follows:—

Water,	82.0
Albumen and Caseine,	1.5
Sugar,	2.8
Starch,	3.5
Fat,	0.5
Gum,	0.7
Woody fibre,	8.0
Mineral matter,	1.0

Total amount of nutritive matter furnished in 100 parts, 8.7, or in 15 tons, produce of an acre, $1\frac{3}{10}$ tons.

CRANBERRIES.

MIDDLESEX SOUTH.

Statement of George Batchelder.

The cranberry ground to which I call the attention of the committee contains one hundred rods. The vines were set in drills two feet apart in the spring of 1861. The soil was mostly peat. The surface, varying from six to twelve inches was removed to the upland for manure, and the whole piece before setting the vines covered with sand to the depth of three inches. The ground was kept as free as possible of weeds the first and second years, after which the vines became so vigorous that but little farther labor was needed. The proceeds and cost are as follows:—

400 loads surface mud at 20 cents per load,	$80 00	
23 bushels cranberries in 1863 at $4 per bushel,	92 00	
130 bushels the present season worth $4 per bushel,	520 00	
		$692 00
Cost of land, labor in grading, sanding, setting vines, weeding, &c.,	$150 00	
Interest and tax,	50 00	
Cost of gathering berries two years,	80 00	
Preparing berries for market,	20 00	
Use of water from reservoir,	10 00	
		310 00
Gain,		$382 00

GEORGE BATCHELDER.

BRISTOL.

Statement of Joseph M. Newcomb.

The crop of 1863 was cranberries. No manure used. The crop of 1864 was cranberries. No manure used. The soil is a peat mud about two feet. No ploughing or other preparation. Flow the meadow every winter. No manure used. In previous years, before 1859, have put on two coats of sand. Harvested from September 25th to 30th. This year I have gathered, without any preparation of the land, $16\frac{1}{3}$ barrels of cranberries, at $12 per barrel, $196. Cost of gathering, $16.33; preparing for market, $5; barrels, $2.67; taxes and interest, $3.60; total expense, $27.60; net profit, $168.40.

I claim the premium on the greatest net profit on one acre of land. JOSEPH M. NEWCOMB.

From actual measurement, I hereby certify that the land which the above crop of cranberries covered, contained 160 rods, and no more.

J. W. CAPRON, *Acting Surveyor.*

Statement of William Babbitt.

The crop of 1863 was five barrels of cranberries. No manure used. The crop of 1864 was 27 barrels of berries. No manure used. The soil is a mud from one to twenty feet deep. No ploughing or other preparation. Cost of cultivation, $151. Cost of harvesting, $37. Paid 40 cents per bushel for picking the berries.

One-half of the vines from which these berries were taken, are two and the other half three years' plantings. I let the water off the 27th day of May last, the meadow having been flowed during the winter and spring. I found, after letting off the water, the grass, such as grows in water, had grown rapidly during the spring months. This grass, and all other vegetation, except the vines, I cleared from the meadow before the vines sprouted, and did but very little to the meadow in the way of weeding during the summer months. After the berries were picked I cleared all the grasses. The weeds should not be pulled in the summer when the vines are in a bearing state, unless it can be done without disturbing the berries and the roots of the vines. And this I think impracticable.*

William Babbitt.

Berkley, September, 1865.

From personal observation, we hereby certify that the above answers are true.

Dexter Marvel.
George Westgate.

From actual measurement, I hereby certify that the land which the above crop of berries covered, contained 3 acres and 40 rods, and no more.

Andrew H. Hall.

MILCH COWS.

ESSEX.

From the Report of the Committee on Heifers.

In attempting to decide which is the best animal, when the Shorthorns, the Jerseys and Ayrshires come in competition, the preferences of different members of the committee for a particular breed will make it difficult to institute a fair comparison. If one member of the committee has come to the conclusion that the Ayrshire is the best cow for this county, it will not be easy for him to award the first premium to a Jersey heifer, however promising she may be. We will not attempt to say how the offers of premiums for heifers should be changed, but we think the duty of the committee would be much more pleasant to themselves, and satisfactory to the public, if they were only to decide which is the best animal of a particular breed, instead of saying which is the best of all the different breeds exhibited.

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* This statement would be all the more interesting if the crop of 1865 had been given.—C. L. F.

Here the question naturally arises, how far the society should direct its efforts and funds to the encouragement of raising our dairy stock? If it can be shown that we can buy our milch cows cheaper than we can raise them, this fact alone does not prove that it would not be better for the community for us to give more attention to stock-raising. The inquiry should not be, which will at first give us the most dollars, but which will have the best influence upon our family? The boy who regularly feeds and cares for his pet calf is acquiring those habits of attention to the wants of our domestic animals, which he can not so well learn in any other way. Those habits of care and regularity will fit him to discharge better the duties of life. The fact that so many of the leading men in all our cities came from those districts where stock-raising formed a large part of the business, shows that the raising of calves has a tendency to elevate men, or to prepare them for a high position. Where all the stock is raised upon the farm there is a kind of mutual attachment existing between the family and the animals that is not found where the stock is bought. The boy upon a farm where stock is raised has an opportunity to learn how to judge of the age of an animal, better than he can where there is an uncertainty about their ages.

We often hear the remark made, that most of the boys are leaving the farm for some other occupation. We think that more attention to stock-raising will have a tendency to attach them more strongly to their homes.

WILLIAM R. PUTNAM, *for the Committee.*

HAMPDEN.

From the Report of the Committee.

We think gentleness and docility invaluable in regard to this class of animals, and that these qualities are promoted by keeping them in the same localities, while sales and exchange produce a contrary effect, and should, wherever reasonably practical, be studiously avoided. A cow transported upon the railroad will be found to have diminished the quantity of her milk. The same consequences may result from driving upon the highway, heat, weariness or fright, or from all these causes combined. Whenever a removal is effected it should be attended with the utmost care. When a cow has been accompanied to her new home, and has been accompanied by the former owner and introduced to the new milkmaid or man, the results have been good. None but *gentlemen* and *gentlewomen*, and boys and girls aspiring to be such, should be permitted to approach milch cows. Whipping, kicking, pounding people should not be tolerated in the stall where the cow should always be milked. She should remain upon a platform in the stall from the evening to the morning milking, where she will be most comfortable and quiet if the stable is kept clean during fly-time. The length of each stall must of course, to secure cleanliness, be adapted to the length of the cow to occupy it.

A want of knowledge of the habits of cows is not unfrequently the cause of ill-feeling. A man purchases a cow, is told she gives twenty quarts of milk per day, and makes a dozen pounds of butter a week. He takes her home, puts her into a yard alone. She is discontented and timorous, does not take her usual supply of food and drink, the expected quantity of milk and butter is reduced one-half or perhaps more, and he is offended with his neighbor without cause, because the representations made at the time of the sale were strictly true.

Although your committee was unanimous in awarding the first premium to Mr. B. B. Trask's eleven year old native—entered as having given nine and one-half pounds of butter per week from December, 1864, to March, 1865, and yielding this quantity on food not considered favorable to butter, such as hay and turnips, let it be remarked that the committee considered the intrinsic qualities of the two Devons exhibited by Mr. William Mattoon, of Springfield, as superior and more worthy of the first honor, and would have so proclaimed, had not a written statement in his case been omitted. Owing to the great importance of this feature in the exhibition of milch cows, and in consideration of this compliance with the regulation of the society by Mr. Trask, it was decided that the interests of exhibitors would be promoted, and especially that the work of the committee would be greatly facilitated in future by setting an example of giving this preference.

Again, in withholding the award from the best milker brought to the attention of your committee, *i. e.*, a Shorthorn owned by Mr. A. N. Merrick of Springfield, as having given twenty-three quarts of milk per day, through the months of June and July, and bestowing it upon Mr. Mattoon's Devons, your committee was influenced by this consideration, namely, that the yield of milk, twenty-three quarts, given by a Shorthorn, which has a reputation for large quantity and poor quality, is not so remarkable as the yield (sixteen and eighteen quarts) of a Devon whose reputation for middling quantity and rich quality is also established. The superiority of this particular family of Devons, their large size, large yield of milk and fine characteristics of the race, could not be overlooked, and though no particular regard in examination was paid to breeds, the committee could not fail to give especial credit to animals so strikingly superior to their race generally.

The entry in this particular class comprised Shorthorns, Devons and Jerseys in about equal proportions, and a student could have obtained a fair knowledge of the characteristics of these breeds by a close examination of their specimens. Yet from the absence of certain and minute knowledge in regard to them in the minds of the owners, any extended remarks of their merits are precluded.

Why must cows be distinguished into those which yield milk to sell, and those which yield milk to manufacture into butter? In other words, why should we seek for quantity aside from quality? As the best products of every trade soon regulate our interest, it may confidently be said that the dealers in so essential a nutriment as milk would soon find it easier to supply a smaller quantity of an excellent article, than now so large a quantity of a poor one, with the prospect of a greater profit to themselves through the developing taste of what is good.

We infer, then, that the true standard of milk cows is one formed of strength and flexibility, that is, a *combination* of quality and quantity, which can be attained on the part of this society by an inflexible adherence to the reasonable conditions regulating the show of stock. Besides the immediate result here contemplated, a very proper secondary one would be the educating of certain faculties of observation and exactitude, which now our practical farmers seem deficient in.

Close observers of cows tell us that there is more difference in the quality than in the quantity of milk,—that out of 100 pounds of milk taken from a herd indiscriminately, one pound less of butter will be made than from 100 pounds taken from selected cows. As an illustration of this, we may mention the Sussex or Cramp cow, that made 600 pounds of butter for several years, out of at most but 20 quarts a day, and the Oakes cow 489 pounds out of at most 18 quarts. A few years ago a Mr. Holbert, of New York, stated that *one* of his best cows made as much butter as three of his poorer ones.

As to the number of cows a farmer should keep, if the special circumstances of domain are left out of the account, we should advise that every one should keep as many as he can well feed and keep in good health. The recommendation to have fewer and keep these highly has been wisely adapted to a very loose and careless style of cattle-raising and milk and butter producing, but now that this wisdom is universally admitted and considerably followed, we must avoid the folly of supposing that there is no very ready way of increasing the number of well kept animals. For we have ample reports of experiments in *soiling* cows, showing that by a proper regard to sowing rye, oats and corn, as a green fodder for summer, and planting roots for winter use, the number of well kept cows can at least be doubled. The experience of our best dairymen shows that an acre of land richly supplied with manure will yield a sufficient quantity of sweet, nutritious fodder to keep four cows three months. And this acre, more or less, of fodder need not be together, but in the most convenient places, and on such spots of soil as can be used for nothing else.

The report of a Massachusetts agricultural society gives, as the answer of a farmer to the question why he kept his eight cows in the barn during the summer, that he gets more milk, more manure, finds cows less troublesome than driving to pasture, and that his whole farm is growing more productive every year. We might multiply many more instances to illustrate our point, that farmers should keep a large number of cows and keep them well, but we forbear, and close this general subject by simply referring you to Mr. Secretary Flint's Treatise on *Milch Cows and Dairy Farming*.

NORMAN T. LEONARD, *Chairman*.

OCTOBER 4, 1865.

HIGHLAND.

From the Report of the Committee.

Your committee on milch and stock cows report as follows: They fully believe that no class of domestic animals better pays for care and attention in breeding. When considered in the light of machines for transforming the products of the soil into those necessary articles of consumption—milk, butter and cheese—it is well to investigate the matter, to find out whether we have just the right kind of animals for producing these, in the greatest quantity, from a given amount of food, and at the same time not lose sight of the fact, that when fattened for beef, the most valuable parts shall be well developed, for obtaining the highest price in the market.

We have these ideas illustrated by a fine cow entered by Mr. Elisha Strong, of Northampton. She is said to have made fourteen pounds of butter in one week, and she is nearly perfect in those points which go to make a beef-producing animal. We believe that the splendid-looking oxen which have graced our fair ground to-day, have in nearly every instance descended from dams possessing their best qualities in a high degree. A well-shaped cow may sometimes produce a poor calf, but an ill-shaped cow seldom drops a good one. To prove the ideas sound, draw a comparison between the average merits of cattle exhibited at the various fairs of the present day, with those of thirty years ago, and we shall find that great results have been obtained by careful attention to breeding.

The difference in product of milk and butter from two cows of equal size and weight, feeding in the same pasture in summer, and foddering from the same mow in winter, is enough to make a large item when the farmer strikes his balance sheet at the end of the year.

Here, then, is opened a wide field in which the intelligent farmer may exercise his mind. And while he is at work in this great laboratory for perfecting the bovine race, he shall be considered as truly a "benefactor of his race" as he who harnesses the lightning and steam for serving his daily wants.

The skilful engineer cares constantly for his locomotive in order to keep it in good working order. Equally important is it to attend to the wants of the animal machine, when we have a good one that will pay well for this care. Good results are generally obtained from cows in the summer months, when the weather is warm, and the food succulent, but when the cold winter comes they are apt to suffer neglect. That farmer will succeed best, who furnishes food and shelter to correspond as much as possible with the warm season. A writer once remarked that "one square foot of boards was equal to one hundred pounds of beef," meaning by the remark that a current of cold air circulating through the stable from loose boards would cause this loss. A warm, well-ventilated stable, early cut hay, some moist food daily, such as roots, or scalded meal made into a slop, fresh water near the stable, and gentleness in handling, will pay good dividends.

LAWRENCE SMITH, *Chairman.*

THE DAIRY.

PLYMOUTH.

From the Report of the Committee.

There was not much difficulty in deciding which was the best butter entered for premium. There were twelve entries. Some were very fine, some were colorless, some nearly odorless, one rancid, and some smooth, tallowish, wanting grain and looking as if "baumed over" and pattered with the hand; and few specimens were of the rich color, and fine, close, sparkling grain, which is to be expected in good butter. The odor to the sense of smell is the surest test of butter. It is not only true that good butter smells well, but if there is anything wrong, as well as anything good in it, it is sure to be detected by this test. The idea that concerning taste there is no ground for argument, is stated in a familiar proverb, that "there is no disputing tastes."

Our experience, as observers and officers of an agricultural society, has convinced us that this variable element of taste is more conspicuous, as applied to butter, than perhaps to any article in the world, unless it be wine. With butter it is a matter of habit. The country grocer decides in favor of salt butter, because he buys and sells firkin butter, and his daily judgment is graduated to that. A grocer, unless he has lived upon a farm, or has familiarized his taste to new butter, cannot appreciate new butter, or butter prepared for immediate use.

On the other hand, a housewife who is accustomed to new butter throughout the year, and likes fresh butter at that, cannot generally judge of the comparative merits of first-rate firkin butter, and fresh, new butter. But a considerate judge, we think, can estimate them truly, by judging by texture, grain, hardness, absence of buttermilk, color and fragrance, as well as the flavor at the moment. Good butter fresh will make good butter salted; and poor butter, fresh or salt, in balls or firkins, never was good at any time. Thorough working, and the most complete extraction of buttermilk, is the the first grand desideratum with all butter. The premiums recommended by the committee are annexed to the report. The butter presented by Mrs. Aretus Forbes, of Bridgewater, was better than the others, to whom no premium was awarded; but it was deficient in quantity, not amounting to twenty pounds, and a gratuity of one dollar is therefore recommended.

CHEESE.—Of cheese there were eleven entries; and here your committee found a difficulty which had never before suggested itself. The society requires an entry of not less than fifty pounds of cheese to entitle the competitor to a premium. But the dairies in this county are small, and the requisite amount is never made in one cheese. Accordingly there were generally three cheeses presented under each entry. But their quality varied more than can be expressed by any statement. If one enters the best cheese, and also the poorest, and another three of medium character, who can make an average of quality? This was an unsurmountable obstacle in the minds of the committee, and they are therefore somewhat diffident of their own conclusions. The premiums were awarded, as far as we could judge, to such as made the most uniform cheeses of good quality. The entries showed generally that cheese-making, in this county, was to a great extent a matter of luck, and not of science, nor that exact knowledge which leads a woman usually to make good bread if she has fair materials. We would therefore recommend that the requirement of fifty pounds of cheese be modified.

This difference in the products of the same dairy from day to day exemplifies the necessity and utility of cheese factories, which are now so common in New York and the West, and numbers of which are also found in Worcester County. Though not entirely uniform, owing to changes in season, weather and the feed of animals, the result has shown that the product of cheese factories, conducted by persons who make its manufacture their sole business, is more uniform and brings higher prices than that of private dairies. It was our intention to condense into this report a description of the formation and management of cheese and butter factories, but the agricultural papers have given such full accounts of them since our exhibition, that they must have already commended themselves to all intelligent farmers, who would have taken a hint from this report. Suffice it to say, that we believe that one or more cheese factories could be sustained in this county, and we ask the serious attention of some of our most enterprising farmers to the matter.

The awards, so far as they have any value, seem to indicate that the farms, or the farmers' wives, of Middleborough and Bridgewater excel in butter, while those of Halifax excel in cheese. The awards were agreed upon without knowing the names of the competitors.

Charles G. Davis, *Chairman.*

HORSES.

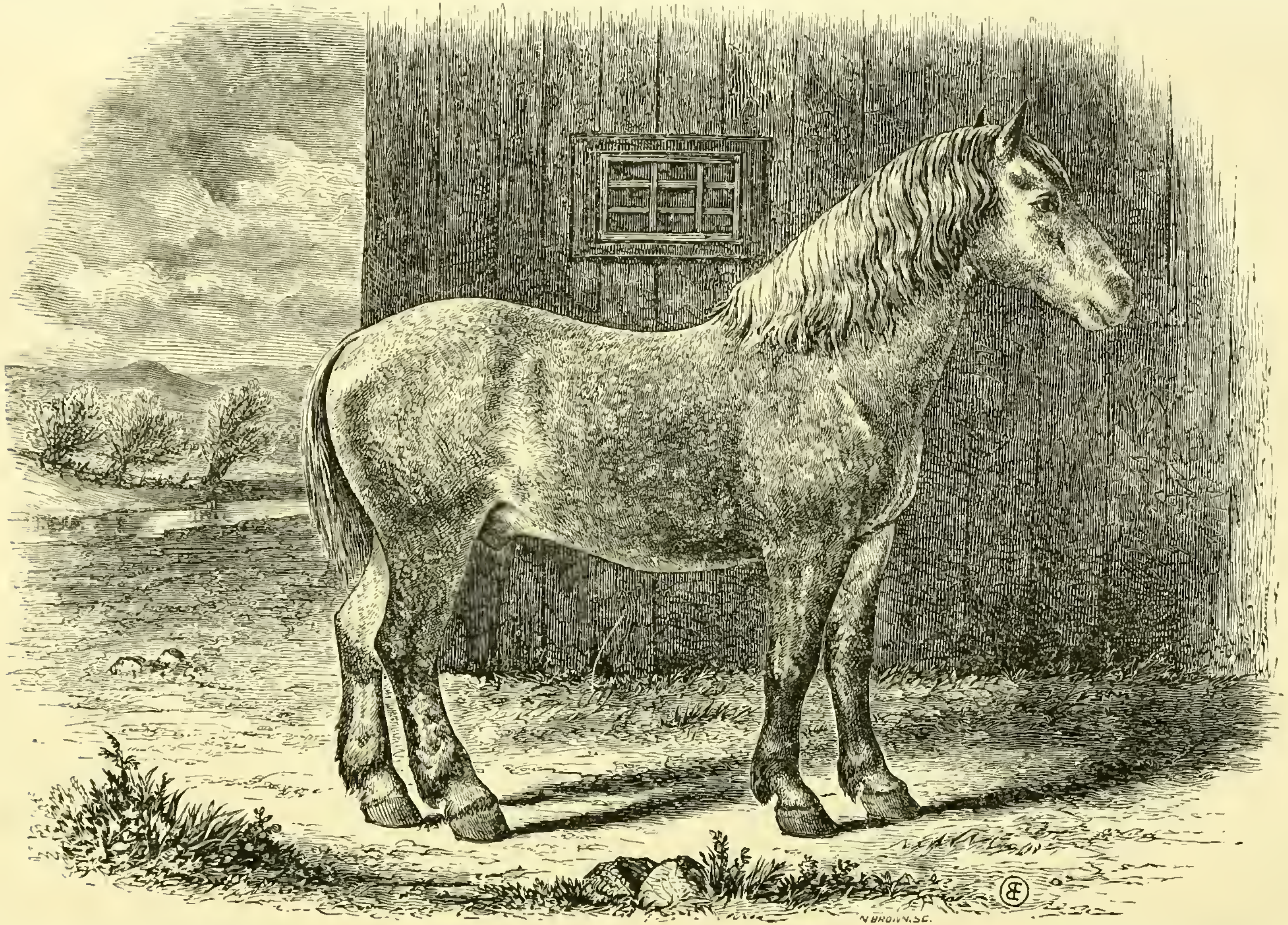
WORCESTER NORTH.

From the Report of the Committee.

We find that a large proportion of the colts raised never pay the expense of raising, because people try to raise them too cheaply. No man would expect to raise a crop of onions upon a piece of worn-out land ; but if he expects to get a profit from the crop, he will select his best soil, use the best manure, and take great pains to obtain the best seed, and apply his best skill in cultivation, and then expects and obtains a bountiful harvest. Let this principle be carried out by horse-breeders and the work is accomplished. To do this, take not the halt, wind-broken mares for breeding, because they are old and worthless for anything else ; but select your young, best-blooded mares, and obtain the service of the best stock-getting horse in the country, and in nine cases out of ten you will raise a good colt. But do not, for a moment, think the colt will take care of himself, but be sure you give him good care for the first two years of his life, at least. A few oats will never hurt a colt, with carrots two or three times a week. Be careful that he has good air and exercise.

Some farmers think they will raise a colt because it will not cost much, for he will eat the orts which the stock refuse. The only reason the colt will eat them is because it is so nearly starved. A colt thus cheaply kept often dies the first winter, but if he chances to live, is obliged to be raised nearly every morning ; but if properly kept will raise himself, with head and tail in the air, and thus acknowledge your kindness to his coltship ; and when grown to the proper age for the market can be sold for from two hundred to five thousand dollars, which pays a large profit for the expense and care bestowed by his owner, and our markets will soon be filled with the finest stock of horses in the world. Let us, as a society, start right, and others will soon follow, and thus challenge the world to compete with Massachusetts in raising fine horses.

Warren Simonds, *Chairman.*



Percheron Stallion—"ORLEANS." Imported by the Mass. Society for Promoting Agriculture, in July, 1864. He is reddish roan, 6 years old stands 16 hands high, weighs 1,450 pounds, and is a perfect type of this admirable race Kept at the Society's stable at Jamaica Plain.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee.

Much has been written and said about the importance of rearing a breed of faster horses than is now in general use by our farmers and the owners of pleasure or carriage horses. No doubt there is room for improvement in this direction, and so long as some animals can trot a mile inside of three minutes as easily as others can in double that time, then some reference should be had to speed by those who make breeding a business. It is useless, however, to prescribe one set of rules with the expectation that it will meet the wants of all classes. The demands of one class would not be that of another; therefore the breeder who had an eye alone to speed would not find a purchaser in the one who needed muscle.

The most profitable as a whole, and best adapted to the wants of a majority in this valley, is the horse of *all work*, combining so far as is possible all the good points of form, speed, muscle and endurance. With men of experience and intelligence, breeding is no longer a matter of uncertainty, and it is nearly as easy to obtain and rear colts possessing all the desired qualities as it is those who have only one. Size as well as form is another desirable object. The most useful and the most profitable horses are those weighing about a thousand pounds. As a general rule it costs more to keep a large horse than a small one, and the one weighing from twelve hundred to thirteen hundred pounds will not perform as much labor, when the cost of keeping is considered, as the one weighing from nine hundred to a thousand pounds. The concussion of bone and muscle while travelling is greater in the large horse than in the small one, and there is necessarily greater exhaustion.

The subject of breed, or the kind of horses as a race best to raise, is a question of great importance, and one upon which there is much diversity of opinion. There has been a great deal said about thoroughbred horses, but there are very few in this country that can claim such distinction. A few breeders in Kentucky and other parts of the South have been engaged in raising pure-blooded horses, but these were bred mostly for the turf, and not for legitimate purposes. This class date their origin back to the race horses of England.

The best for all uses that have been raised in this country are the Morgan horses of Vermont. These are not, however, pure-bloods. The original horse, from which the name is derived, was purchased, when two years old, in Springfield, Mass., in 1795, by Justin Morgan, of Randolph, Vt. Its sire dates its origin back to an imported horse; the dam, however, was possessed of no peculiarities of blood. There were four colts of this horse kept as stallions,—Revenge, raised in Claremont, N. H.; Sherman Morgan, raised in Lyndon, Vt.; Bulrush, raised by Mr. Gifford, of Tunbridge, Vt.; and Woodbury or Burbank, also raised in Tunbridge. The Black Hawk is a Sherman Morgan. This latter breed is noted for quickness in motion, round bodies and long necks. They are very fleet, and are what might be termed a "genteel" horse.

The Woodbury Morgans are more closely built, and have great compactness of frame. The Bulrush Morgan is very hardy, being noted for great powers of endurance. He is a good roadster, and in fact good for all work; is heavily built, has large muscle, thick and heavy mane, tail and foretop. These horses have probably added more to the wealth of the country than all other breeds combined. They are extensively raised in Northern Vermont, and have been one of its greatest sources of income. It is a fact of some importance that the Morgan horses of Vermont have stood the campaign better than all the other horses that have been used in the rebellion.

HENRY M. BURT, *Reporter.*

SHEEP.

WORCESTER.

From the Report of the Committee.

Sheep husbandry has been felt to be a power in the land equal at least to the first of agricultural productions. Although the number of sheep has vastly increased since the war commenced, and the production of wool is much more than it was in 1860, yet that increased supply has not been nearly equal to the increased demand. It is now estimated, from reliable data, that the consumption of wool in 1864 was nearly double that of 1859. While the whole of the production of the country amounted to 100,000,000 pounds, the consumption was 160,000,000 pounds, leaving 60,000,000 pounds to be supplied by the foreign farmer, for which we have had to pay gold.

We have a number of enterprising manufacturers who have commenced the manufacture of worsted dress goods, worsted braids and other trimmings. The production of these goods requires a kind of wool which has been sparingly produced in this country, and for a supply our manufacturers have been indebted to the Canadian farmers, and have paid them the past season from 40 to 50 cents per pound, gold, or from 65 to 70 cents, currency. We cannot give a better idea of the importance of this class of goods, and the necessity of producing the class of wool required for their production, than by quoting a paragraph from the "Mark Lane Express," on the changes in the value of different wools:—

"An extraordinary change, in fact, has taken place in the trade, by virtue of which the long and the fine short wools have changed places, the former having advanced and the latter receded in price, especially lamb's wool of native growth. This description has fallen to about 14 pence or 28 cents per pound, while Leicestershire teggs or hoggets wool from the same sheep will fetch or has fetched 2s. 6d., or 60 cents per pound, the fleece weighing fourteen pounds. The causes for so strange an alteration in the wool trade are various, but may be traced to the introduction of the Alpacca or Lama wool, from Peru. The length and fineness of this material enabled the manufacturer to make a kind of fabric entirely new to the British market, namely, those light gossamer stuffs, known as alpaccas, so much prized and worn by our fair countrywomen. The success of this material set the manufacturers to work to attempt imitations of it from the long wools of British growth. In this they succeeded, especially since the invention of combing wool by machinery, about fourteen years ago. By the use of this machine wool can be combed two and a half inches long, but it is the long Lincolnshire, Leicester, Yorkshire, Romney Marsh and Cotswolds wool that has so much increased in value since the introduction of Alpacca wool. The facility for perfecting these wools for the purpose of making imitations of Alpacca fabrics is one of the causes of the advance, for the enormous demand for such fabrics for foreign countries, with the supply limited to the growth of the United Kingdom, has rendered this far more scarce than the short wool."

The raising of this kind of wool involves two other very important points, the production of mutton and lambs, which, at the present time of scarcity of live stock, are of vital importance to the whole community; and it is the combination of these three points, wool, mutton and lambs, which has rendered sheep husbandry so extremely profitable to the English farmer, and has given him the exclusive privilege of furnishing this class of wool for the world, and the English manufacturer the exclusive privilege of producing imitation Alpacca dresses for the ladies of the world. That it can be made equally as remunerative in this country we have no doubt, as the testimony of those farmers who have made the trial abundantly proves.

A member of your committee, who keeps this class of sheep, says that he has received the present year, for his lambs when between three and four months old, $6 each, and the fleeces from his ewes averaged him $3 each.

Mr. G. Calvin Rice furnishes your committee with the following account of the produce from his flock of Cotswold and Leicesters: Of seven lambs, dropped between the 22d of January and the 8th of February, 1865, he sold to the butcher, on the 15th of May, four for $42.75; three he sold for stock for $22; five which were dropped later he sold about the middle of July for $24.24—these were the produce of nine ewes; he sold 70½ pounds of wool from twelve sheep, at 40 cents per pound, unwashed, $28.20; total, $118.19. A pair of lambs from one ewe sold for $17.72; the wool sold for $2.30, making a total of $20 from one ewe.

The breeds of sheep which your committee would recommend for the farmers of Worcester County to keep, and which to them would be the most remunerative, and are best adapted to meet the wants of the country at the present time, are the Leicesters or Cotswolds and their crosses, the Teeswater or the Lincolnshires, the Leicester and Southdown crosses. The brighter the wool the more valuable it is, being so much the better adapted to produce imitation Alpaccas and Mohair braids.

There are consumed in England, in the manufacture of Alpacca dresses, about two million pounds of wool obtained from that animal; while in the city of New York alone there are more goods sold under that name than the whole amount could produce. Not one yard in a hundred sold by that name is made from the wool of the animal whose name they bear, but are made from the wool of the breeds of sheep which we recommend to the farmers of this society.

Before the war we were large importers of Mohair braids; now the energy of our manufacturers bids fair to drive the imported article entirely from the market. It must be remembered that these are made from coarse wool, and in order to obtain a supply we have to carry gold to Canada to fill the purses of the Canadian farmers, when a large portion of it ought to find its way into the pockets of the farmers of Worcester County. And unless the efforts of our manufacturers are sustained by the active co-operation of the farmers, we fear they will have to abandon the enterprise, and leave the field once more open to the united energies of the British manufacturer and farmer.

It will be in vain that we plead as an excuse that soil and climate are not favorable for the production of such sheep. What advantage has Canada, in either soil or climate, over this county? We know of none, and yet Canada succeeds. The British farmer, upon high-priced lands, succeeds because he has a market for mutton and lambs, and he makes every effort to supply that market. And in his effort to supply it with good mutton he furnishes the best of wool. This is produced from the hoggets and wethers, when well fed. The object of the English farmer is to get these ready for the butcher at as early an age as possible, and as the best of food produces this result, so also the best feed produces the most and best of wool.

The farmers of Worcester County, and almost every other location in Massachusetts, have as good a market for mutton as the English farmer has, and can raise as good wool as they choose. It is not the pastures which are deficient, as some maintain, which causes the farmer to fail in the treatment of this class of sheep, but it is the want of proper care and feed in winter. Whenever a sheep is allowed to lose condition there is a serious defect in the wool; hence the reason why sheep, when once fat, should never be allowed to grow poor, but whether ewes or wethers when once fat should be sold to the butcher.

The increase in the production of mousseline de laines causes an increased demand for another kind of wool, which, in some sections of Worcester County is produced very successfully, and not surpassed even in Great Britain. The Southdown and Merino cross produces an excellent wool for this purpose, and we have seen good wool produced from a cross with the Merino and Leicester, and Merino and Cotswold, and from these crosses we have seen excellent mutton and very good lambs produced, and we know of a great many instances where they have been exceedingly profitable to the farmer.

The increase in our woollen manufactories requires an increased production of the pure-bred Merino, and when there is no market for mutton it is the most profitable sheep raised; it is the wool-producing sheep, and our vast prairies should be pastured by the sheep in place of the deer and buffalo.

Though there are but few specimens of pure-breeds exhibited, yet the different kinds of wool which our exigencies require have been well represented in the different animals which have competed for the prizes. Mr. F. M. Wood, of Grafton, exhibited some pure-bred Merinos. His were the only specimens upon the ground, and although we would give the preference to the Merino in all those localities where there is a market for wool only, yet it is our opinion that where there is such a good market for mutton and lambs, and such an increasing demand for long wool, the mutton breeds are the kinds which ought to be kept in Worcester County. The Merino matures slowly and produces small lambs, and converts a large amount of its food into grease and black gum, while the mutton breeds convert the same food into mutton. The unwashed Merino fleece will shrink in cleansing and preparing for the cards from 65 to 80 per cent., the Cotswold from 18 to 30 per cent.; and though we do not claim that the mutton breeds will produce a greater weight of wool in proportion to weight of carcase, we do claim that the mutton breeds will produce a greater weight of mutton and wool in proportion to the quantity of food consumed than the Merino.

THOMAS WHITAKER, *Chairman.*

AGRICULTURAL STATISTICS OF MASSACHUSETTS FOR 1865.

It will be recollected that in my Report for 1855 I included the returns of the Statistics of Industry so far as they related to the agriculture of the Commonwealth. The Table was found extremely convenient for reference, and though containing many and very palpable imperfections and inaccuracies, arising from the unpardonably loose and careless manner in which the statistics, in many instances, were gathered, it was the only official return that was available to the public for the succeeding five years.

The Returns of 1865 are open to very serious criticism in many of their details, and it would not be difficult to show that they are far from what they should be. Still, they are the best we shall have for the present, probably, and as such they are given in the following pages.

COUNTIES.	FARMS.								
	No. of Farms.	Acres of land.	Value of same, including buildings.	Persons empl'd.	Acres of land improved.	Acres of unimproved land.	Acres of unimprovable land.	Acres of woodland.	Value of same.
Barnstable, . . .	942	57,368	$1,842,332	1,149	37,265	37,965	22,264	72,015	$691,540
Berkshire, . . .	4,131	498,770	12,502,083	6,958	248,993	139,902	68,126	112,545	2,120,232
Bristol, . . .	4,264	237,558	11,545,481	5,704	94,078	64,688	9,598	114,118	2,243,584
Dukes, . . .	368	36,032	712,776	629	25,494	15,198	3,436	11,658	152,842
Essex, . . .	3,307	187,980	12,186,222	5,574	124,474	51,578	4,835	42,877	1,375,863
Franklin, . . .	3,533	370,793	8,045,751	5,197	191,978	104,954	50,222	63,127	1,141,129
Hampden, . . .	3,427	316,403	9,450,806	4,851	165,017	88,512	35,785	55,315	1,430,244
Hampshire, . . .	3,722	323,229	11,033,790	5,947	183,098	69,041	21,101	44,952	1,035,696
Middlesex, . . .	6,456	412,859	26,660,189	10,220	217,015	129,742	13,818	89,626	3,372,894
Nantucket, . . .	111	6,175	140,735	245	6,167	8,513	500	705	9,500
Norfolk, . . .	2,954	181,439	18,852,239	4,431	91,263	46,322	3,437	74,304	1,993,731
Plymouth, . . .	4,205	235,682	9,814,444	4,924	104,987	68,405	8,021	161,271	2,725,247
Suffolk, . . .	64	4,422	989,400	322	3,838	511	–	40	4,000
Worcester, . . .	9,420	839,185	29,170,410	12,485	453,711	205,594	41,296	176,586	5,108,620
Totals, . . .	46,904	3,707,895	$152,946,658	68,636	1,937,378	1,030,925	282,439	1,019,139	$23,405,122

COUNTIES.	INDIAN CORN.			WHEAT.			RYE.			BARLEY.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Barnstable,	2,702	60,879	$95,570	51	505	$1,011	1,260	10,282	$16,921	275	4,982	$6,570
Berkshire,	6,208	175,128	265,149	220	3,107	5,826	2,106	33,718	36,711	658	15,258	19,751
Bristol,	5,908	163,542	219,374	135	1,841	3,871	1,489	15,753	21,656	850	20,552	26,099
Dukes,	588	15,380	25,694	-	-	-	162	1,289	2,253	33	380	669
Essex,	4,440	133,334	185,665	319	6,012	7,448	797	13,029	16,643	888	15,311	20,674
Franklin,	5,779	185,469	241,955	533	8,611	16,465	2,102	23,768	28,071	279	6,206	7,152
Hampden,	6,853	163,177	226,086	112	1,869	4,162	6,310	64,142	87,599	127	2,309	3,171
Hampshire,	6,342	187,511	288,254	285	4,814	10,155	3,189	36,745	50,420	129	2,778	3,865
Middlesex,	9,294	289,466	401,283	107	1,407	2,734	2,278	25,382	40,181	997	15,406	20,065
Nantucket,	236	7,575	10,433	3	52	105	3	28	41	50	1,100	1,866
Norfolk,	3,152	88,382	140,895	20	197	478	692	10,664	16,884	414	6,860	9,152
Plymouth,	4,182	122,697	198,471	160	2,153	5,112	1,052	10,497	18,421	313	5,255	7,665
Suffolk,	26	952	1,045	-	-	-	72	1,894	2,089	5	140	113
Worcester,	11,878	393,193	605,483	763	10,212	23,517	1,761	23,222	37,651	2,159	42,058	55,731
Totals,	67,588	1,986,685	$2,905,357	2,708	40,780	$80,884	23,273	270,413	$375,541	7,177	138,595	$182,543

COUNTIES.	BUCKWHEAT.			OATS.			MILLET.			BROOM CORN.				
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Pounds of Broom Brush.	Value.	Bush. of Broom Seed.	Value.
Barnstable, . . .	-	-	-	221	4,811	$3,951	-	-	-	-	-	-	-	-
Berkshire, . . .	1,610	26,935	$26,187	6,623	138,332	139,594	-	-	-	-	-	-	-	-
Bristol, . . .	38	582	753	1,853	58,284	45,428	-	-	-	-	-	-	-	-
Dukes, . . .	-	-	-	228	4,466	2,614	-	-	-	-	-	-	-	-
Essex, . . .	11	125	172	907	21,320	17,019	-	-	-	-	-	-	-	-
Franklin, . . .	142	1,800	1,624	2,324	67,359	49,967	-	-	-	205	105,970	$15,633	8,362	$5,070
Hampden, . . .	1,270	15,411	15,005	3,106	54,780	49,736	-	-	-	8	4,700	739	359	177
Hampshire, . . .	571	6,232	5,429	2,361	55,492	45,357	-	-	-	287	179,515	30,887	17,911	11,976
Middlesex, . . .	182	2,624	2,580	2,523	53,346	41,178	28	126	$498	-	-	-	-	-
Nantucket, . . .	-	-	-	6	82	83	-	-	-	-	-	-	-	-
Norfolk, . . .	40	498	640	494	10,335	9,630	9	110	147	-	-	-	-	-
Plymouth, . . .	40	751	733	735	16,261	15,064	1	25	60	-	-	-	-	-
Suffolk, . . .	-	-	-	1	15	9	-	-	-	-	-	-	-	-
Worcester, . . .	390	5,192	5,976	6,937	181,114	164,278	18	392	1,423	-	-	-	-	-
Totals, . .	4,294	60,150	$59,099	28,319	665,997	$583,908	57	653	$2,128	500	290,185	$47,259	26,632	$17,223

COUNTIES.	ALL OTHER GRAINS.			HERDS-GRASS SEED.			CLOVER SEED.			HOPS.		
	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Pounds.	Value.
Barnstable,	–	–	–	–	–	–	–	–	–	–	–	–
Berkshire,	13	257	$1,153	2	9	$60	9	15	$356	109	24,828	$9,661
Bristol,	13	800	1,320	–	–	–	–	–	–	1	1,350	550
Dukes,	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	34	302	928	2	10	50	–	–	–	–	–	–
Franklin,	–	–	–	–	15	80	–	–	–	31	9,778	2,630
Hampden,	14	33	438	4	8	45	5	5	62	–	–	–
Hampshire,	13	239	453	6	26	109	1	2	6	4	2,500	625
Middlesex,	47	861	2,721	1	12	36	–	–	–	79	35,916	11,890
Nantucket,	–	–	–	–	–	–	–	–	–	½	150	60
Norfolk,	–	–	4,685	–	–	–	–	–	–	–	–	–
Plymouth,	–	–	–	–	–	–	–	–	–	–	–	–
Suffolk,	–	–	–	–	–	–	–	–	–	–	–	–
Worcester,	121	1,465	1,118	13	66	314	–	–	–	51	18,556	6,622
Totals,	255	$3,957	$12,816	28	146	$694	15	22	$424	275½	93,078	$32,038

COUNTIES.	TOBACCO.			SORGHUM.			BASKET WILLOW.		CRANBERRIES.		
	Acres.	Pounds.	Value.	Acres.	Gallons of Syrup.	Value.	Acres Cultivated.	Value.	Acres.	Bushels.	Value.
Barnstable,	½	360	$90	-	-	-	-	-	1,075	13,324	$37,816
Berkshire,	166	198,800	29,277	6	142	$116	¼	$20	3	25	50
Bristol,	3	2,420	777	-	-	-	-	-	345	5,424	14,225
Dukes,	½	800	150	-	-	-	-	-	34	790	2,586
Essex,	5	4,850	1,076	-	-	-	½	40	196	1,441	4,595
Franklin,	1,953	3,143,799	516,210	3	396	399	-	-	9	103	258
Hampden,	1,037	1,569,643	308,445	-	-	-	-	-	4	6	30
Hampshire,	2,409	4,394,925	751,654	-	-	-	5	500	10	6	30
Middlesex,	5	3,405	732	-	-	-	8	560	782	4,042	11,733
Nantucket,	-	-	-	-	-	-	-	-	140	52	157
Norfolk,	½	775	248	-	-	-	-	-	773	4,973	15,522
Plymouth,	2	1,646	701	-	-	-	3	60	349	3,318	10,068
Suffolk,	-	-	-	-	-	-	-	-	-	-	-
Worcester,	36	40,218	7,036	½	60	60	-	-	163	1,663	5,295
Totals,	5,617½	9,361,641	$1,616,396	9½	598	$575	16	$1,180	3,883	35,167	$102,365

COUNTIES.	ENGLISH HAY.			MEADOW OR SWALE HAY.			SALT HAY.		
	Acres.	Tons.	Value.	Acres.	Tons Mown.	Value.	Acres Mown.	Tons.	Value.
Barnstable,	3,766	4,565	$90,145	1,066	1,137	$10,876	5,847	5,925	$39,320
Berkshire,	76,095	63,291	1,096,463	9,357	7,747	83,074	-	-	-
Bristol,	33,772	27,727	618,687	7,076	4,572	47,972	1,446	1,580	22,482
Dukes,	1,602	1,679	37,370	407	425	5,634	403	420	4,653
Essex,	35,854	34,970	916,379	11,390	9,524	103,784	14,135	11,906	141,188
Franklin,	43,364	44,434	699,044	8,299	6,133	51,822	-	-	-
Hampden,	34,616	35,283	741,586	12,009	9,914	87,283	-	-	-
Hampshire,	44,904	44,181	880,776	9,184	8,069	99,656	-	-	-
Middlesex,	62,484	59,202	1,582,310	28,253	24,430	267,405	1,454	1,589	25,986
Nantucket,	800	1,350	25,747	22	22	204	57	133	1,270
Norfolk,	29,858	29,471	801,129	12,955	9,412	122,954	1,993	2,346	41,125
Plymouth,	23,815	21,200	483,834	9,023	7,381	73,862	5,018	4,380	43,583
Suffolk,	1,017	1,419	30,115	-	-	-	1,121	1,207	15,195
Worcester,	115,036	107,987	3,581,485	34,786	27,660	320,876	-	-	-
Totals,	506,983	476,759	$11,585,070	143,827	116,426	$1,275,402	31,474	29,486	$334,802

COUNTIES.	POTATOES.			TURNIPS.			ONIONS.			CARROTS.		
	Acres.	Bushels.	Value.	Acres of Turnips cultivated as field crops.	Bushels.	Value.	Acres.	Bushels.	Value.	Acres.	Bushels.	Value.
Barnstable, . .	1,087	47,521	$34,072	105	14,947	$7,990	18	231	$402	37	7,499	$2,805
Berkshire, . . .	3,763	471,802	214,876	82	21,205	6,067	9	1,632	2,219	31	11,300	14,545
Bristol, . . .	3,421	287,839	222,750	368	100,988	39,324	93	24,702	37,518	17	6,321	2,275
Dukes, . . .	207	16,234	11,657	75	10,966	4,037	8	1,407	2,646	6	1,300	592
Essex, . . .	4,847	379,232	320,057	750	41,379	14,606	413	104,513	166,216	127	51,533	22,559
Franklin, . . .	2,341	251,920	105,622	49	15,604	3,652	32	14,202	17,365	16	7,549	3,237
Hampden, . . .	3,474	305,051	181,800	428	76,107	18,455	11	1,710	2,644	28	9,837	4,286
Hampshire, . .	2,823	277,728	143,047	115	27,110	6,306	10	3,134	4,251	26	9,508	3,296
Middlesex, . . .	6,265	513,764	433,175	430	85,192	33,070	76	16,657	27,545	109	-	21,803
Nantucket, . .	46	4,807	4,856	27	4,936	1,787	2	139	227	9	2,425	821
Norfolk, . . .	2,879	230,815	271,831	187	37,522	14,643	58	15,177	16,751	79	34,129	13,773
Plymouth, . . .	2,841	218,026	163,703	157	38,847	19,707	61	16,380	30,493	33	12,212	6,122
Suffolk, . . .	118	16,402	13,150	5	2,650	1,349	27	7,240	7,540	8	4,040	2,525
Worcester, . .	8,046	804,400	486,606	256	56,530	15,731	14	3,546	5,787	104	30,105	17,891
Totals, . .	42,158	3,826,540	$2,607,202	3,134	533,983	$186,724	832	210,670	$321,604	527	187,758	$116,530

COUNTIES.	CABBAGES.		WINTER SQUASHES.		GARDEN SEEDS.			MARKET GARDENS.		BEETS, &c.		
	Acres.	Value.	Acres.	Value.	Acres.	Value.	Value of garden seeds prepared for market.	Acres.	Value of products.	Acres of Beets and other esculent Vegetables.	Bushels of Beets and other esculent Vegetables.	Value.
Barnstable,	4	$570	–	–	–	–	–	37	$2,996	18	2,032	$1,036
Berkshire,	25	5,208	3	620	3	$3,140	$2,004	21	3,624	19	6,930	3,286
Bristol,	43	8,738	5	1,219	–	–	–	303	29,668	41	12,473	6,699
Dukes,	–	–	–	–	–	–	–	1	170	3	525	243
Essex,	263	45,851	140	23,169	10	3,423	4,038	468	89,058	127	23,861	20,589
Franklin,	403	1,103	–	–	$\frac{1}{8}$	25	–	–	–	1	411	154
Hampden,	25	5,936	4	734	–	–	170	82	12,570	51	274	7,106
Hampshire,	12	1,218	2	250	–	–	–	15	3,160	3	2,407	1,061
Middlesex,	297	58,183	304	49,752	17	4,765	2,725	2,340	490,311	167	41,429	42,054
Nantucket,	–	–	$\frac{1}{5}$	25	–	200	200	10	800	3	1,115	424
Norfolk,	156	33,226	88	12,176	10	927	180	255	57,278	93	16,302	8,827
Plymouth,	43	7,115	8	1,350	2	630	–	72	10,262	52	7,175	7,118
Suffolk,	45	8,212	27	3,210	–	–	–	20	2,500	16	4,460	2,340
Worcester,	90	23,966	16	3,271	3	430	196	111	19,453	88	19,499	8,970
Totals,	1,206	$199,326	597$\frac{1}{5}$	$95,776	45$\frac{1}{8}$	$11,540	$9,563	3,735	$722,150	682	138,893	$109,907

COUNTIES.	FLAX.					FRUITS.						
	Acres.	Pounds.	Value.	Bushels of Flax-seed.	Value.	Number of Apple Trees cultivated for their Fruit.	Value of the Apples.	Number of Pear Trees cultivated for their Fruit.	Value of the Pears.	Number of all other Fruit Trees.	Value of the Fruit.	Value of Nuts or Berries cultivated or gathered for market.
Barnstable,	-	-	-	-	-	20,904	$4,396	4,038	$1,586	3,305	$547	$1,098
Berkshire,	39	6,111	$1,043	184	$449	110,624	54,991	7,791	2,946	6,537	2,161	1,948
Bristol,	-	2	1	-	-	143,834	43,990	30,151	12,137	10,427	5,530	12,385
Dukes,	-	-	-	-	-	6,202	2,855	1,154	453	2,207	609	976
Essex,	-	-	-	-	-	294,184	179,414	63,023	37,111	9,502	3,192	16,680
Franklin,	-	-	-	-	-	109,172	71,985	2,925	1,571	1,106	1,064	2,616
Hampden,	-	-	-	-	-	131,393	70,781	7,145	4,344	2,791	1,086	3,075
Hampshire,	-	-	-	-	-	139,031	92,292	3,079	2,705	871	430	2,508
Middlesex,	-	-	-	-	-	544,309	300,369	106,401	66,641	17,097	9,960	59,593
Nantucket,	-	-	-	-	-	-	-	-	-	-	-	-
Norfolk,	-	-	-	-	-	172,520	102,866	65,866	76,989	13,542	12,803	32,549
Plymouth,	-	-	-	-	-	172,373	79,389	26,732	11,169	9,510	6,614	11,689
Suffolk,	-	-	-	-	-	4,271	986*	3,109	1,928	14	10	1,000
Worcester,	-	-	-	-	-	485,070	253,163	52,414	20,758	15,141	7,881	17,421
Totals,	39	6,113	$1,044	184	$449	2,333,887	$1,257,477	375,828	$240,338	92,052	$51,887	$163,538

* Crop destroyed by Canker Worm.

COUNTIES.	HORSES.		ASSES AND MULES.		OXEN AND STEERS.			COWS AND HEIFERS.			Value of other Neat Stock.
	Number.	Value.	Number.	Value.	Number of Oxen over four years old.	Number of Steers under four years old.	Value of Oxen and Steers.	Number of Milch Cows.	Number of Heifers.	Value of Cows and Heifers.	
Barnstable,	2,218	$149,062	1	$15	345	494	$35,509	3,592	1,042	$152,134	$3,565
Berkshire,	7,583	712,901	9	900	1,923	2,491	226,118	17,609	3,410	717,866	40,500
Bristol,	6,288	578,112	15	1,685	1,825	733	162,867	8,749	1,425	368,049	5,723
Dukes,	335	26,445	1	75	215	266	19,648	706	276	28,782	550
Essex,	7,638	690,348	8	425	3,177	766	278,241	11,864	1,505	506,047	6,410
Franklin,	4,467	357,092	2	200	2,865	3,364	347,116	8,622	3,384	372,906	50,591
Hampden,	6,184	617,979	–	–	2,855	2,359	310,433	10,506	3,228	457,443	26,053
Hampshire,	5,701	492,015	16	1,875	2,214	2,904	303,941	9,587	2,829	442,107	51,508
Middlesex,	15,232	1,643,738	12	875	3,218	1,095	303,100	22,302	3,228	996,262	19,338
Nantucket,	251	20,746	1	50	26	34	3,142	449	122	18,927	325
Norfolk,	8,552	1,076,346	19	1,785	1,021	214	96,632	9,610	956	452,437	7,550
Plymouth,	5,188	437,777	7	285	1,901	911	182,950	7,931	1,430	388,127	11,232
Suffolk,	6,657	1,283,440	12	1,300	32	12	4,250	453	101	24,643	310
Worcester,	13,998	1,166,631	3	135	7,479	4,883	790,797	31,306	8,164	1,611,904	67,120
Totals,	90,282	$9,252,632	106	$9,005	29,096	20,526	$3,064,744	143,286	31,100	$6,537,634	$290,775

COUNTIES.	MILK.		BUTTER.		CHEESE.		BEEF.	
	Gallons sold.	Value.	Pounds sold.	Value.	Pounds.	Value.	Pounds of Dressed Beef.	Value.
Barnstable,	91,426	$20,516	42,306	$15,277	720	$130	696,771	$81,749
Berkshire,	76,827	14,732	525,756	188,107	1,641,203	259,386	2,085,242	355,538
Bristol,	1,047,378	180,894	168,464	58,429	22,706	3,583	4,018,443	460,463
Dukes,	16,189	6,229	14,329	5,803	1,554	265	150,214	15,525
Essex,	1,267,922	249,027	205,505	80,703	22,477	4,185	569,300	945,141
Franklin,	56,198	5,468	404,169	182,327	106,484	10,832	2,179,849	223,773
Hampden,	411,443	86,373	352,866	117,289	314,337	54,782	3,854,418	502,544
Hampshire,	151,817	19,409	411,825	135,118	184,135	23,371	2,469,052	269,177
Middlesex,	3,111,318	589,058	415,339	147,869	14,601	1,967	33,016,837	3,667,883
Nantucket,	10,831	2,599	14,436	6,137	-	-	117,090	16,162
Norfolk,	1,139,121	250,538	144,483	50,267	11,271	1,940	3,773,082	462,655
Plymouth,	254,115	55,969	195,797	80,020	27,264	6,412	4,062,125	474,461
Suffolk,	83,175	20,141	-	-	-	-	-	-
Worcester,	2,320,615	459,456	840,115	321,676	1,120,999	395,223	7,042,136	753,788
Totals,	10,038,372	$1,930,409	3,795,790	$1,389,027	3,467,751	$772,076	71,084,569	$1,228,859

COUNTIES.	SHEEP AND WOOL.									
	Number of Saxony Sheep of different grades.	Number of Merino Sheep of different grades.	Number of all other kinds of Sheep.	Gross value of all Sheep.	Number of lbs. of Wool produced from Saxony Sheep.	Value.	Number of lbs. of Merino Wool.	Value.	Number of lbs. of all other Wools produced.	Value.
Barnstable, . .	-	150	1,682	$7,850	-	-	150	$315	4,585	$3,652
Berkshire, . . .	494	31,649	21,713	224,553	1,508	$1,014	136,665	121,438	91,168	57,312
Bristol, . . .	248	2	5,033	25,247	645	397	6	6	15,960	12,808
Dukes, . . .	-	3,506	6,822	35,103	-	-	9,770	10,603	17,371	17,531
Essex, . . .	27	196	3,144	21,781	133	63	1,179	614	10,859	7,447
Franklin, . . .	1,340	12,671	24,449	116,092	2,665	2,489	44,020	31,256	61,816	43,801
Hampden, . . .	74	1,326	10,441	50,319	210	170	4,844	4,117	34,105	23,983
Hampshire, . .	44	5,706	15,929	80,784	250	116	22,108	16,104	50,306	42,024
Middlesex, . .	128	206	2,354	15,922	506	246	149	112	8,907	5,741
Nantucket, . .	-	-	2,153	7,837	-	-	-	-	3,623	3,058
Norfolk, . . .	321	136	1,004	9,837	2,665*	15	281	187	4,238	2,033
Plymouth, . . .	124	35	5,790	34,737	617	417	99	97	20,535	15,388
Suffolk, . . .	2	200	25	1,205	-	-	1,055	478	100	50
Worcester, . .	324	245	10,349	68,523	1,605	1,238	1,028	897	41,077	26,370
Totals, . .	3,126	55,428	110,888	$699,790	10,804	$6,165	221,354	$186,224	364,650	$261,198

* West Roxbury returns 2,639 pounds of Saxony Wool, but gives no value.

COUNTIES.	MUTTON.		VEAL.		CHEESE FACTORIES.			SWINE.	
	Pounds of dres'd Mutton.	Value.	Pounds of dres'd Veal.	Value.	Number.	Pounds manufactured.	Value.	Number.	Value.
Barnstable, . .	15,185	$2,171	56,245	$5,553	-	-	-	1,882	$57,372
Berkshire, . . .	138,999	13,457	140,216	17,563	1	80,000	$16,000	4,148	56,277
Bristol, . . .	199,716	29,201	314,846	38,707	-	-	-	6,088	94,291
Dukes, . . .	26,029	2,748	6,320	616	-	-	-	360	3,836
Essex, . . .	749,723	110,200	632,023	86,954	-	-	-	7,911	139,696
Franklin, . . .	82,752	9,767	74,882	7,461	-	-	-	2,876	39,739
Hampden, . . .	187,206	19,123	327,223	49,281	-	-	-	5,067	79,147
Hampshire, . .	165,239	26,123	236,245	27,851	-	-	-	3,964	60,118
Middlesex, . .	6,955,343	804,062	1,034,390	132,350	-	-	-	9,972	201,333
Nantucket, . .	25,890	3,584	11,423	1,356	-	-	-	108	2,153
Norfolk, . . .	113,134	11,655	417,761	52,300	-	-	-	6,018	121,981
Plymouth, . . .	153,222	27,310	375,142	52,037	-	-	-	4,799	104,046
Suffolk, . . .	-	-	-	-	-	-	-	704	15,143
Worcester, . .	228,299	32,190	1,407,136	174,051	4	304,811	65,019	9,324	167,656
Totals, . .	9,040,737	$1,091,531	5,033,852	$646,083	5	384,811	$81,019	63,221	$1,142,788

COUNTIES.	PORK.		POULTRY.	EGGS.	HONEY.		BEESWAX.		Value of other articles of farm produce not before enumerated.
	Pounds of dressed Pork.	Value.	Value.	Value.	Pounds.	Value.	Pounds.	Value.	
Barnstable, . .	414,807	$73,719	$3,850	$69,612	130	$65	–	–	$3,572
Berkshire, . . .	1,482,214	289,732	14,532	16,024	12,661	3,144	435	$1,713	7,811
Bristol, . . .	1,624,731	248,517	33,346	51,253	5,433	1,487	242	70	7,142
Dukes, . . .	104,103	20,531	2,013	3,070	–	–	–	–	730
Essex, . . .	1,652,840	326,905	18,793	35,038	7,108	2,372	188	76	25,461
Franklin, . . .	1,188,136	168,103	9,111	8,887	5,706	1,541	89	42	5,354
Hampden, . . .	1,186,123	188,231	13,459	14,996	9,283	2,316	296	109	25,746
Hampshire, . .	1,360,996	196,656	8,690	13,673	4,794	1,183	166	76	14,810
Middlesex, . .	13,411,284	1,998,129	28,655	39,575	9,449	2,680	224	85	67,400
Nantucket, . .	56,958	11,119	667	953	65	32	–	–	1,912
Norfolk, . . .	1,460,480	375,665	15,737	22,426	4,496	1,628	86	63	41,972
Plymouth, . . .	1,863,256	339,987	28,286	58,221	3,998	1,347	112	66	34,012
Suffolk, . . .	– –	– –	563	75	–	–	–	–	4,640
Worcester, . .	3,306,224	538,598	41,049	39,426	17,233	5,429	616	157	32,666
Totals, . .	29,112,152	$4,775,892	$218,751	$373,229	80,356	23,224	2,454	$2,457	$273,228

INDEX

TO THE ABSTRACT.

[For Index to the Report see end of First Part.]

Page.

Apples, cultivation of, ... 42, 46, 48, 50

Barley, statements on, ... 72

Carrots, culture of, ... 92
Corn, raising of, ... 59, 61, 63, 68, 70, 71
Cranberries, statements on, ... 95, 97

Dairy, the, report on, ... 103

Elements of fertility, ... 25, 27
Experiments with manures, ... 55, 56

Farm accounts, keeping of, ... 3, 6, 15
Farms, reports on, ... 1, 3, 6, 11, 12, 14, 21
Grain Crops examined, ... 56, 58, 60

Horses, reports on, ... 106, 107

Insects, destruction of, ... 43, 44

Mangolds, cultivation of, ... 82, 84
Manures, application of, ... 13, 54
Manures, experiments with, ... 55, 56
Milch cows, reports on, ... 97, 98, 102

Onions, culture of, ... 80
Orchards, requirements of, ... 36, 39, 43, 47, 52

Parsnips, cultivation of, ... 94
Pears, varieties of, ... 40, 42, 48, 51

Reclaimed lands, statements on, ... 29, 31, 33, 35
Root crops, statements on, ... 73, 76, 82
Rye, cultivation of, ... 63

Sheep, report upon, ... 108
Statistics of Agriculture, ... 113–127
Stock, importance of keeping, ... 28

Turnips, cultivation of, ... 73, 76, 86, 89, 91

Wheat, raising of, ... 62